Columbia University in the City of New York

PRESIDENT'S ANNUAL REPORT

1899

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TENTH
ANNUAL REPORT
OF
PRESIDENT LOW
TO THE
TRUSTEES

NOVEMBER 6, 1899

NEW YORK
PRINTED FOR THE UNIVERSITY
1899

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To the Trustees of Columbia College in the City of New York:

I have the honor to submit herewith my annual report for the academic year ending June 30, 1899.

It seems desirable to make mention here, as this report is presented a month later than usual, although the event belongs in strictness to another year, of the death of Cornelius Vanderbilt, a Trustee of the University, which occurred September 12th. Mr. Vanderbilt was elected a Trustee in 1891, at the time of the union with Columbia University of the College of Physicians and Surgeons. He was a member of the Committee on Site which in 1892 recommended the purchase of the grounds now occupied by the University on Morningside Heights. After the purchase of this site, he was an active member of the Special Committee on Buildings and Grounds which developed the plans that have taken shape here. In these relations, as well as in the discharge of the general duties of a Trustee, he was, according to his habit, punctiliously faithful to the trust he had undertaken. He was seldom absent from any meeting either of a Committee or of the Board, and never without sending an explanation of his absence. He gave to the University freely the benefit of his wide experience and large influence. It is owing to the largeness of mind of Mr. Vanderbilt and his brothers and relatives who had joined in the endowment of the College of Physicians and Surgeons, as well as to the breadth of view of the Faculty of that College, that the College of Physicians and Surgeons is now an integral part of Columbia University. In other ways and on other occasions, he aided generously the projects in which the University was interested. His partial disablement a few years ago was a serious misfortune; his death now is a heavy loss and a genuine sorrow. He will be gratefully remembered by men of Columbia, both for his benefactions and for his devoted personal service to the University.

In response to the invitation of the President of the United States, and with the consent of the Trustees, the President of the University accepted a commission as one of the delegates from the United States to the International Conference of Peace which began its sessions at The Hague on the 18th of May. In order that the President might discharge this duty, the Trustees granted to him a leave of absence, without salary, from the 1st of May to the end of the academic year. Professor John Howard Van Amringe, Dean of Columbia College, was appointed by the Trustees Acting President of the University for this period. I wish to express my heartiest thanks to Professor Van Amringe for the readiness with which he undertook to discharge the added duties thus devolved upon him, and to congratulate him upon the conspicuous success with which he met the many and varied demands of the position. Professor Van Amringe is so loyal a son of Columbia and has been, withal, so long in the service of his Alma Mater, that there is no one to whom the President could have surrendered the functions of his office, for this brief period, with so great a sense of personal pleasure and satisfaction. It was doubtless a pleasure also to every Columbia man that Professor Van Amringe should have enjoyed the privilege of representing to the public the University as a whole, as he has so long and so ably represented Columbia College. He had thus the good fortune of presiding at the Commencement and of enrolling among the adopted sons of Columbia the Hon. Theodore Roosevelt, Governor of New York, the Hon. Carl Schurz, Rear-Admiral George W. Melville, U. S. N., Edward Livingston Trudeau, M.D., whose sanitarium in the Adirondacks has been of such great benefit, and John Aikman Stewart, the President of the United States Trust Company.

In the month of December the Special Committee on Buildings and Grounds presented a final report of its proceedings in connection with the new site and the buildings erected thereon. The report was accepted, and the Special Committee, which had consisted of the Chairman and the Clerk of the Trustees in addition to the statutory membership of the Committee, was discharged. The care of the buildings and grounds since that date has devolved upon the Committee as constituted under the Statutes.

The total cost of this development up to June 30, 1898, as shown in my last annual report, was $6,879,011.90. Of this total, the amount paid for interest was $339,812.08. In my report of last year I said that the net debt against the new site, as well as I could then judge, would be likely to be a trifle less than $3,750,000. By net debt, I mean debt not offset by assets which may be used for its extinguishment without reducing the endowments upon which our educational work depends. This sum disregarded the debt against the College of Physicians and Surgeons, which amounts, in round numbers, to $86,500. It was pointed out that at 4% the interest upon $3,750,000 would be $150,000 per annum; and I ventured to express the hope that friends of the University might be found who would enable us to fund this debt at 3%. I am happy to be able to report that the year under review has brought substantial relief both in the actual amount of the debt still outstanding and in the annual charge for interest payable. Upon the 30th of June, 1899, the net debt against the new site was, approximately, $3,575,000. The annual interest account upon this sum, as the debt then stood, amounts to $113,000. The year, therefore, has resulted in a diminution of the expected net debt by $175,000. In the meanwhile, successful efforts to re-fund a large portion of the debt have resulted in a reduction of the annual interest charge against the new site by as much as $37,000.

It gives me pleasure to record at this time, although it properly belongs to the story of another year, that the President has discharged in full the obligations entered into by him on account of the construction of the Library. This has resulted in the still further reduction of the debt against the new site, as it appeared on the 30th of June, by the sum of $600,000. At the date of this report, therefore, the net debt against the new site is approximately $2,975,000. The interest charge to be annually met on this account is $95,000. The interest charge against the College of Physicians and Surgeons is approximately

$3500. The annual interest charge against our entire net debt, therefore, is approximately $98,500. This is a large item, but not larger than ought to be easily carried, while it must be, in this wealthy and generous community. Every year, by gifts and bequests, and through coöperation of various sorts, this charge ought to be steadily reduced.

There appears to be no reason to doubt that the current work of the University in all departments can be maintained in full vigor, notwithstanding this heavy interest charge. The growth of the University, however, is necessarily checked until this incubus is removed. I renew my appeal to the public-spirited people of the city who appreciate what Columbia University means and may be made to mean, both to the city of New York and to the whole United States, to limit the necessity of thus marking time to as short a period as possible. A little of this experience can be endured without serious disadvantage; but unless New York is prepared to be left behind by other communities in the educational privileges it offers, the city must not permit its oldest university to be long deprived of the ability to expand its usefulness as opportunity invites.

The site formerly occupied by Columbia College at 49th Street and Madison Avenue was sold during the year to Dr. John S. White, the Principal of Berkeley School. This school now occupies a part of the former Hamilton Hall, on the corner of Madison Avenue and 49th Street. It is gratifying to know that at least this corner of the interesting group of buildings so long occupied by the College is still to be used for educational purposes. The privilege of placing a tablet upon the Berkeley School building, to indicate that this site was occupied by Columbia College for forty years, was retained by the Trustees and willingly assented to by Dr. White. The tablet reads as follows:

COLUMBIA COLLEGE
OCCUPIED THIS SITE
FROM MAY 1857
TO OCTOBER 1897

A tablet is also being prepared to be placed upon one of the buildings standing upon the old site of the College near the City Hall. The tablet will be placed upon the building on the corner of Murray Street and West Broadway, and will read as follows:

KING'S COLLEGE
Founded by Royal Charter
in 1754 in the reign of George II
and
re-established in 1784 by
THE PEOPLE OF THE STATE OF NEW YORK
under the name of
COLUMBIA COLLEGE
occupied this site from August, 1755, to May, 1857

The enforced removal of the College from place to place is singularly characteristic of the city of New York. The enlargement of the College into the University which now occupies its splendid home on Morningside Heights is equally characteristic of the city. The growth of Columbia University reflects the city's advancement, not only in population and in wealth but also in ideals, and in its willingness to spend for the realization of its ideals. The uninterrupted development of the University ought to enlist both the affection and the civic pride of the people of the city.

EDUCATIONAL ADVANCES

Notwithstanding the necessity under which the University has labored of confining its expenditures within existing limits, some steps of educational interest and importance have been taken during the year. In coöperation with Teachers College acting as a part of the University, arrangements have been made for a Summer School to be maintained at the University beginning with the summer of 1900. Experience elsewhere has shown that such schools become self-supporting in a few years. A guarantee for one year has been obtained, which is believed to be sufficient to justify the opening of such a school at Columbia. It goes without saying that so costly and so useful a plant as that of the University ought not to be idle for a quarter of the year; and it is matter of congratulation that it is no longer to be so. While it is a new thing at Columbia for a summer school, or for a summer session, as it ought rather to be called, to be held at the University itself, Columbia has been a pioneer in offering instruction in the summer at a distance from the University in connection with certain of its scientific courses. The Summer School of Surveying, for example, first, and still, I think, the most important school of its kind, which has been located for many years at Morris, Conn., was attended last summer by one hundred students from the various courses in the School of Engineering as part of their regular work. It is interesting to record the extent to which this sort of work is being carried on by the University, at the moment that the University is about to hold a summer session upon the home grounds. The University maintains, besides the Summer School of Surveying, summer schools in Geodesy, Geology, Mechanical Engineering, Mining, and Practical Metallurgy. Much summer work is also done in Zoölogy at various stations.

At the request of the Committee upon Commercial Education of the New York Chamber of Commerce, a plan was prepared and submitted to the Chamber for the establishment at Columbia at an early day of a Collegiate Course in Commerce. The plan was approved by the Chamber, and an effort is to be made by it to raise the necessary funds for the establishment of the Course. The plan calls for an annual guarantee, for the term of five years, of from $12,000 to $20,000, according to the completeness with which the plan is to be put into operation. Such schools have been successfully carried on in Europe for a number of years, and some of them are connected with universities and colleges. They have turned out men of a new type who have been of no little service particularly to Germany in her contest for the world's markets. If such schools are not soon established in America, men trained abroad in the European schools, little as they may know of our American traditions, will more and more take the subordinate places of importance in our commercial and industrial system, to the exclusion of our own young men who cannot get such training here. It is clearly desirable that commercial training of a high order should be open to American young men at home. It cannot be contended that training of this sort is proper to a college as if it were a kind of liberal education; but it certainly belongs to a university whose object it is to make specialists, if maintained at the proper level, as evidently as the training of a chemist or an architect. It is convenient at Columbia, as a matter of administration, to start the Course in Commerce under the wing of the College.

An interesting departure of the year was the arrangement for the delivery, in coöperation with the Brooklyn Institute of Arts and Sciences, of certain courses for teachers in Brooklyn. The work in these courses was sufficiently serious to be accepted in partial fulfilment for the requirements of the Teachers College diploma. They were availed of by 228 students, most of them teachers in the public schools of Brooklyn. Similar courses were given in the Boroughs of Queens and Richmond. The total number of students reached by these extension courses, in connection with those given at Teachers College itself, amounted to 1047.

Owing to the rapid progress in the development of the New York Botanical Garden, arrangements were completed during the year for the removal to the Garden of the herbarium of the University and of the principal part of our botanical library. With the beginning of the academic year 1899–1900, the advanced work in botany will be carried on in the laboratories of the Garden. By this combination of the resources of the University with those of the Garden, the Garden gains, at the beginning of its career, a scientific equipment and a scientific importance which otherwise it could hope to achieve only slowly. The University, on the other hand, receives at once the advantage of the added facilities of the Garden. Even now, these are considerable; and as the years go on, they will become of the greatest importance. Already the privileges for investigation and research which are offered by the Garden to advanced students in botany through this coöperation with the University probably exceed, in scope and completeness, any other opportunity available in the United States.

By special vote of the Trustees, the same privileges in the University have been extended to students of the Drew Theological Seminary at Madison, N. J., as have hitherto been enjoyed by the students of the General Theological Seminary, the Union Theological Seminary, and the Jewish Theological Seminary. These privileges permit certain students of the seminaries to attend courses at the University without additional fee, thus enabling the University to offer to such students instruction in sociology and kindred subjects not ordinarily included in the curriculum of the theological seminaries. It is pleasant to record that under the operation of this system the University has entered into harmonious relations with seminaries identified with the Episcopal, the Presbyterian, the Jewish, and the Methodist bodies.

SCHOLARSHIPS

A very important Statute of the year provided for the substitution, for the system previously existing of free and reduced tuition, of a system of scholarships in the College and in the Schools of Law and of Applied Science. A similar scholarship system had already been adopted for some of the other schools of the University. It was pointed out in my last annual report that, in the form of fellowships and scholarships and by the waiver of tuition fees in whole or in part, the University was actually making grants in aid of students to an amount exceeding in value $58,000 per annum. The largest part of this aid was then given in the form of free and reduced tuition. Under the new system, scholars receive in money the amount of their tuition fees, and with this money they pay their fees, instead of receiving directly a grant of free or reduced tuition. The effect upon the treasury is the same, but it is believed that the effect upon the student will be much better. As far as possible the grant of these scholarships is made on the basis of ability that has been demonstrated. A certain number may be granted, for special reasons, to students believed to have such ability, but who are thought to have been prevented by their circumstances from making a complete demonstration of the fact. In this connection, the Trustees, in pursuance of a policy to which they committed themselves when subscriptions were received for the removal of the University to its new site, availed of the opportunity to name certain of the scholarships thus established after those who had been benefactors of the University in connection with the purchase of its new grounds. One scholarship was established for every $5000 received for this purpose. Those whose liberality has been commemorated in this way are:

J. Pierpont Morgan,
Cornelius Vanderbilt,
D. Willis James,
A. A. Low,
Morris K. Jesup,
R. Fulton Cutting,
Alfred Corning Clark,
Jacob H. Schiff,
Samuel D. Babcock,
Oswald Ottendorfer,
Samuel Sloan,
Henry Parish.

These scholarships, collectively, are known as Benefactors Scholarships. Individually, they are known as Morgan Scholarships, Vanderbilt Scholarships, and the like. There are, in all, 63 such scholarships. Of these, 20 have been assigned to the College, 16 to the School of Law, and 27 to the Schools of Applied Science. The distribution of these scholarships between the College and the other schools concerned was regulated, for the most part, by the existence or absence of other foundations for the aid of students. The necessities of the various schools, as demonstrated by past experience, were met by the establishment of certain other scholarships, known as Faculty Scholarships. Of these, 10 were established in the College, 4 in the School of Law, and 8 in the Schools of Applied Science.

Benefactors Scholarships can be granted only to students who have completed with credit at least one year in the University. Faculty Scholarships may be granted, under suitable regulations, to students about to enter the University. No effort is spared to make the grant of all of these scholarships an academic honor.

In furtherance of the desire to make the University as far as possible a centre for research, the Trustees have thrown open the laboratories of the

University, without fee, to all who have taken the degree of Doctor of Philosophy from the University.

CLUBS

Interesting evidence of the intellectual activity of the University at the present time, and of the growth of a common life on the part of those whose studies lead them in the same direction, is to be found in the rapid formation of clubs whose membership includes the professors and students of certain of the departments. During the last two years, such clubs have been established in the Departments of History, Germanic Languages and Literatures, Literature, and Romance Languages and Literatures. Each of these clubs aims, in its own way, to develop both a more intense and a wider interest in the subject to which it relates. Besides the clubs already named, there is a Graduate Club, which aims to develop especially the interest of the non-professional graduate students of the University. This club is affiliated with the graduate clubs of other universities.

EDUCATIONAL INCIDENTS

Several incidents of the year appear to be worthy of record. By general consent, in response to the request of the Hon. Ferdinand W. Peck, Commissioner-General of the United States to the Paris Exposition of 1900, Wednesday, October 19, 1898, was observed in many of the colleges and universities of the country, as well as in the public schools, as Lafayette Day. At Columbia, an interesting address, "On the Life and Services to this Country of

Lafayette," was delivered by Prof. James H. Robinson of the Department of History.

In response to the invitation of the University of Cambridge, England, Columbia University was represented at the Jubilee of Professor Sir George Gabriel Stokes, Bart., Lucasian Professor of Mathematics in the University of Cambridge, which was held in June, 1899, by Prof. R. S. Woodward, the Dean of the Faculty of Pure Science. This occasion, by bringing together distinguished and representative men from all parts of the world, was not only an interesting landmark in the history of an ancient university, but those who attended it will return to their work full of a new interest and vigor born of sympathetic and inspiring companionship.

By authority of the Trustees, the President appointed Professors Gottheil and Jackson to represent the University at the International Congress of Orientalists to be held at Rome, in the early part of October, 1899. Professor Gottheil was unable to attend the sessions of the Congress; but Professor Jackson has been present and taken part in its proceedings. It is pleasant to record that Professor Jackson, besides representing the University, represented also the American Oriental Society, and was one of three official delegates representing the Government of the United States.

The Baccalaureate preacher of the year was the Rev. Samuel D. McConnell, D.D., Rector of Holy Trinity Church, Brooklyn. By the courtesy of the Bishop of New York, the service was held in the crypt of the new Cathedral of St. John the Divine. The University was thus able to enter into close and gratifying relationship with its neighbor the Cathedral. It has been the habit, for many years, for the Trustees to invite, every other year, a clergyman of the Episcopal Church to preach the Baccalaureate sermon. In the alternate years, the sermon is preached by a representative of some other denomination. A year ago, the Baccalaureate preacher was the Rev. Henry Van Dyke, D.D., of the Brick Presbyterian Church, and the service was held upon our own grounds. In the absence of a chapel, the service had to be held in the chemical lecture room. In planning for the development of the new site, the Trustees have designated a suitable place upon the grounds for a chapel. I renew the appeal which I made a year ago for the gift of such a building. Without a chapel the religious life of the University cannot have adequate expression. Such a building might also serve as the headquarters of all the religious activity of the students. I earnestly hope that someone may be moved, in the near future, to strengthen the life of the University in this important way.

MEMBERSHIP OF THE UNIVERSITY

As the year under review is the last of the decade during which the writer has been President of the University, it is interesting to summarize the growth of the institution. In this interval, the officers of instruction have increased from 170 to 339; the officers of administration, from 13 to 20, including the deans, who figure in the foregoing table simply as professors; the emeritus officers, from 3 to 12. In round numbers, the equipment of the University, both for purposes of teaching and for administrative work, is half as great again at the end of the decade as it was at the beginning. The number of professors and adjunct professors has increased from 41 to 84, showing that the increase in numbers represents a proportionate increase in officers of high grade, and not merely a multiplication of subordinate officers. The increase, in point of fact, has been symmetrical all along the line.

For the last two years, the following is the

SUMMARY OF OFFICERS

	1897–98	1898–99
Professors	63	70
Adjunct Professors	11	14
Clinical Professors and Lecturers	13	15
Demonstrators	4	3
Assistant Demonstrators	9	9
Instructors	48	54
Tutors	30	32
Assistants	45	51
Curators	3	3
Lecturers	13	25
Clinical Assistants	65	63
Officers of Instruction	304	339
Officers of Administration	12	12
Emeritus Officers	9	12
Total	325	363

The large increase of officers, indicated by the foregoing table, represents, in the case of professors and adjunct professors, officers of Teachers College who, by virtue of the recent agreement between the University and Teachers College, have become officers of the University in so far as they give instruction leading to degrees. Although the two corporations remain distinct, the increase of teaching strength is actual and real as regards both the University and Teachers College. These figures do not include officers of Barnard College who are not officers in Columbia University; neither do they include officers of Teachers College who are not related to work that counts for a degree.

As an educational factor, however, Columbia University includes all of the work of Barnard College. The work of Teachers College that does not count for a degree is also educational work of very great value. As a part of the work of Teachers College, this is carried on under the ægis of the University; but it is not taken account of in the University statistics because it is not of collegiate or university grade. It will be convenient, in this report and hereafter, to give pertinent educational statistics relating to all parts of the University.

From this point of view, there should be added to the foregoing Summary of Officers, 2 officers of instruction and 4 officers of administration whose work lies in Barnard College alone. The summary already includes the officers of Teachers College who give instruction recognized for a degree. The reason for the difference in presentation is that the officers of Barnard College give instruction only to the students of Barnard College. The officers of Teachers College may, and do, give instruction to students of the University who are not students of Teachers College. It is well understood, I presume, that Barnard College is a college for women in close affiliation with the University; and that Teachers College is a professional school for teachers, differing from a normal school in that it is upon a university basis, and offers to students, through its connection with the University, both more extensive and more numerous opportunities for advanced work in every subject interesting the teacher.

SUMMARY OF STUDENTS

Comparing the year 1898–99 with the first year of the decade, some interesting results are obtained.

	Students		Percentage	
	1889–90	1898–99	1889–90	1898–99
Undergraduates........	269	403	16.19	18.27
Graduates.............	515	801	31.01	36.22
Non-Graduates.........	877	1004	52.80	45.51
	1661	2208	100 %	100 %

These figures do not include either Barnard College or Teachers College.

The proportion of college undergraduates has increased, during the decade under review, by 2.8 % of the total membership ; and the percentage of graduate students has increased by 5.21 %. The percentage of non-graduate students, on the other hand, has fallen from 52.80 % of the total membership, to 45.51 % ; that is to say, it has fallen 7.29 %. Expressed in figures rather than by percentage, the undergraduate collegiate body has increased from 269 to 403 ; the graduates from 515 to 801 ; and the non-graduates, from 877 to 1004. In other words, out of a total gain for the decade of 547, the gain in the College (that is to say, of candidates for the degree of Bachelor of Arts), and the gain in students who hold a first degree, is 420. The gain in non-graduate professional students is 127. Inasmuch as the Schools of Applied Science, in this investigation, are included as professional schools, the total gain in non-graduate professional students is to be found in this group of schools alone, which have increased in the decade from 266 to 459, of which, in the earlier year, 218 were without a degree, and in the current year, 391. That is to say, the decade has witnessed not only an important increase of numbers, but also an improvement, not less marked, in the quality of the students who are taking advantage of the educational opportunities offered by the University.

In order to show the entire sphere of influence affected by Columbia University in the last year of the decade, there should be added to the foregoing figures those which relate to Barnard College and Teachers College. The following summary of students by schools gives these figures. At the beginning of the decade, Barnard College and Teachers College had just been established. The latter had then no relation to Columbia University. The table, therefore, gives a comparison of the year 1898–99 with the previous year only.

SUMMARY OF STUDENTS BY SCHOOLS

	1897–98				1898–99			
	Holding a degree	Not holding a degree	Total	Percentage of degrees	Holding a degree	Not holding a degree	Total	Percentage of degrees
Law	228	139	367	62	217	132	349	62
Medicine	319	444	763	42	303	423	726	42
Applied Science	53	376	429	12	68	391	459	15
Political Science Philosophy Pure Science	205	58	263*	78	213	58	271*	78
	805	1017	1822	44	801	1004	1805	44
Columbia College		335	335			403	403	
			2157				2208	

Brought forward...........		2157		2208
BARNARD COLLEGE :				
Undergraduate Students....	172		202	
Graduate Students.........	58	230	76	278
TEACHERS COLLEGE :				
Candidates for Diploma and Special Students.........	137		297	
Extension Students	299	436	1173	1470
		2823		3956
Auditors.....................		34		29
Grand Total..............		2857		3985

* Total number receiving instruction :	1897–98	1898–99
Political Science.........................	310	240
Philosophy...............................	255	321
Pure Science..........................	184	194

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

The geographical distribution of students at the beginning and end of the decade is also interesting. The increase of attendance from the middle and far West is very noticeable.

	1889–90	1898–99
New York City..............................	759	1250
Brooklyn..................................	201	
New England States......................	119	125
Middle States..............................	483	529
States north of Ohio River and east of Mississippi River..............................	47	87
States south of Ohio River and east of Mississippi River..............................	48	62
States west of Mississippi River and east of Rockies	48	83
States west of Rockies and on Pacific Coast...	14	34
	1719	2170
Foreign countries......................	34	38
	1753	2208

As the more recent tendencies in this regard are also a matter of interest, I append a table showing the geographical distribution of the students for the last four years.

	1895–96	1896–97	1897–98	1898–99
New York City	1040	1073	1210	1250
New England States	103	111	131	125
Middle States	502	499	525	529
States north of Ohio River and east of Mississippi River	65	74	87	87
States south of Ohio River and east of Mississippi River	43	47	59	62
States west of Mississippi River and east of Rockies	64	64	64	83
States west of Rockies and on Pacific Coast	22	27	41	34
	1839	1895	2117	2170
Foreign countries	32	26	40	38
	1871	1921	2157	2208

The last year at the 49th Street site was 1896–97. The percentage of students in the University registering from New York City was almost precisely the same in that year as in the academic year 1898–99; namely, 56%. From these figures it would appear that rather more than half of the total membership of the University registers from the Greater New York. It is to be said, however, that a considerable proportion of students who come to the University from a distance, for graduate work, come to the city intending to make it their place of residence. Such students usually register as from New York. These figures, therefore, do not indicate with entire accuracy the places of origin of our student body. Roughly speaking, however, it may be said that one-half of our student population comes from New York City as now constituted, and one-half hails from a distance. The percentage of students from a distance differs materially in the different schools.

THE LIBRARY

The year under review marks an important epoch in the history of the library, for it has witnessed the end of the active service of Mr. George H. Baker as Librarian. On the 1st of July, 1899, Mr. Baker became Emeritus Librarian, on half salary; and James H. Canfield, LL.D., succeeded him as Librarian. Dr. Canfield is a graduate of Williams College in the Class of 1868, and at the time of his election as Librarian was President of the Ohio State University.

Especial attention is asked to Mr. Baker's report for the academic year ending June 30, 1899; for, in that document, he has summed up in a most interesting way the growth and development of the library since it has been under his care. Confining my own comments to the heads usually treated in my report, it is gratifying to point out that the number of volumes added to the library during the year was 25,404, of which number 18,288 volumes were obtained by purchase or exchange. By gift, 5141 volumes were received; and 1975 volumes were formed by the binding of pamphlets and other material. The additions during the last five years have been as follows:

1894–95..................	24,839
1895–96..................	20,584
1896–97..................	11,928
1897–98..................	16,377
1898–99..................	25,404

The comparatively small number of accessions for the years 1896–97 and 1897–98 reflect the interruption in the growth of the library caused by removal to the new site.

The increased use of the library as indicated by the loans of books to be read at home is well brought out by the following table, which shows the number of such loans made during a series of years.

1889–90	16,004
1890–91	22,721
1891–92	26,632
1892–93	28,184
1893–94	42,015
1894–95	53,474
1895–96	59,756
1896–97	67,975
1897–98	47,832
1898–99	77,261

The falling off in the year 1897–98 reflects again the closing of the library for several months during its removal from Forty-ninth Street to its present building

There is no better indication than these figures afford of the noteworthy increase in the intellectual activity of the University. They reflect, also, undoubtedly, a great change in the method of teaching; the new method sending students more and more both for information and for investigation to the library. They likewise indicate the vast importance of the library as a factor in the modern education of students. A recent visitor from one of the English universities expressed his congratulations that the library had been made the central feature of the University;

because, he remarked, "a great library would make a great university; but it did not necessarily follow that a university would make a great library."

Good progress has been made during the year in the publication, through the Bulletin of the New York Public Library, of lists of periodicals relating to various topics contained in that library and in the library of the University. The subjects covered during the year under review were literary periodicals, periodicals relating to general history, periodicals relating to science in general, and technical periodicals.

Arrangements have been entered into for the closer coöperation of the University library, in its educational section, with the Bryson library of Teachers College. The catalogues are to be amalgamated, and the transfer of books from one library to the other is to be permitted as circumstances may make desirable. The effect will be, practically to consolidate the two collections into one. The combination thus made will be exceedingly strong, both in books upon education and in educational periodicals.

Gifts of money during the year for the purchase of books amounted to $14,821.83.

From the same anonymous friend who has helped us so frequently	$10,000.00
From S. P. Avery, including sales of catalogue	2,971.83
From F. A. Schermerhorn	1,500.00
From William G. Low	300.00
From G. K. Sheridan	50.00
	$14,821.83

THE GYMNASIUM

With the opening of the year, the gymnasium began its active work. Under the regulations of the

College Faculty and of the Faculty of Applied Science, the first two classes in the College and in the Schools of Applied Science were called upon to work in the gymnasium two hours a week under instruction. The number of students thus enrolled for required gymnastic work was 454. A careful record was kept of the attendance of each man, and a report concerning each one was made at the end of the year to the respective Deans. In addition to this required work, optional classes were organized for the benefit of students who could use the gymnasium only in the afternoons. These classes were conducted on Mondays, Wednesdays, and Fridays, each class averaging in number from 30 to 50.

The Director reports that 635 physical examinations have been made. These examinations include all students representing Columbia University in athletics; the members of the classes taking required work, and all other members of the University who presented themselves for examination.

Some idea of the use that has been made of the gymnasium may be gathered from the following figures:

Number of lockers assigned 1,384

Attendance, not including those taking the required work:

October	1680	
November	3955	
December	3384	
January	3718	
February	4665	
March	4498	
April	1138	
		23,038

Swimming Pool:	
Number of baths for the year	25,000
Handball Courts:	
Number using	9,989
Number of men taught to swim	74

ATHLETICS

With the removal of the University to Morningside Heights and the occupancy of the gymnasium, a new impulse has been given to athletic sports as a part of the life of the student body. In view of the abuses which so easily show themselves in connection with such sports, and in view of the reviving interest in them at Columbia, it is worth while to speak somewhat at length upon this subject. The principal difficulties to be contended with spring from the intercollegiate character of such sports. Intercollegiate competition, while it gives great zest, makes such sports very costly; encourages the expenditure of large sums for trainers and coaches who are often professionals; for surgeons, and the like; and places university athletics upon a basis so nearly professional that often the only distinction to be found is in the fact that the players themselves do not profit by the large gate receipts. In the meanwhile, the spirit of intercollegiate rivalry engenders betting and tempts the athletic managers of colleges and universities to strive for success without regard to means. I confess to a certain distrust of the permanency of a system in which large gate receipts and the results that flow therefrom are an integral part. The very essence of amateur competition in athletics appears to me to be that those who contest should pay their own expenses, and that neither the individuals who compete nor the organizations they represent should receive any profit from the contest. On the other hand, despite this heavy indictment of the system as it is, the influence of athletic sports, properly conducted, even under this system, is undoubtedly beneficial in many ways. Such sports make men of temperate lives the students' heroes ; they help large numbers of men to pass safely through the critical years of young manhood ; they develop self-restraint, self-discipline, courage, staying power, and many of the qualities that tell powerfully in the battle of life ; they offer to the educator an instrument whose training value no wise man will neglect. The problem is to check as many as possible of the abuses of intercollegiate athletics and to develop all that is good in them. As Columbia, in her new home, seems likely to be more of a factor in this field than heretofore, I desire to say that the influence of the University will be thrown as strongly as possible in favor of accenting in every way the amateur character of such competitions.

In order that the attitude towards this question of the University as a whole, and of the various faculties in particular, may be perfectly understood, it is necessary to make clear the educational conception upon which the organization of Columbia University rests. At Columbia, a clear distinction is made, when speaking technically, between the college and the university. This distinction is not arbitrary, and neither is it imaginary. It depends upon a recognized difference in aim. The aim of the college, as it is conceived at Columbia, is to give a liberal education ; that is, to develop the man. The aim of the university is to make a specialist. That is why the Schools of

Applied Science, for example, which, in many places, would be looked upon as the scientific department of the college, at Columbia are held to be a part of the University. Their object, distinctly, is to make specialists. It is true that the work of the first two years in all of these schools consists principally of the pure sciences upon which the professional training rests; sciences which, in themselves, certainly are as much in place in the college as in a scientific school. But the aim of the Schools of Applied Science being, as I have said, to make specialists, these schools at Columbia are deemed to be a part of the university.

So far as the College is concerned, therefore, it is believed by the authorities that athletic sports have a valuable and legitimate relation to the life of the students. Where the object is to develop the whole man, it is impossible not to welcome anything that tends so strongly to develop the sound body that ought to be the instrument of the sound mind. The attitude of the College Faculty, therefore, is friendly to such sports when conducted upon a strictly amateur basis and with a high sense of honor such as becomes gentlemen.

In the University departments, where the aim is to make specialists, the students are presumably older, and, theoretically, at least, should have passed through the experience in athletic sports which is proper to a college. In the graduate departments of the University, therefore, the attitude of the faculties is simply to disregard the question. So long as a student does not permit his work to be interfered with, the faculty is indifferent whether he takes part in such sports or not. On the other hand, the faculty, in making its arrangements for the work of the year, takes into consideration the single aim for which it exists, that is, to make the best possible specialists in the subjects under its control.

The Schools of Applied Science at Columbia fall midway between these two extremes. From the point of view of theory, their aim, as has been said, is to make specialists. They pursue this aim also with the greatest earnestness and devotion. The work demanded of the student is exceedingly hard, and covers a large part of the summer as well as the usual academic term. On the other hand, in the two earlier years the students taking these courses are students of the College age and full of the same desire and impulse for athletic sports as their comrades of the College. Ultimately, it is hoped that these Schools of Applied Science may begin with their present third year, the work of the first two years being transferred to the College. It is already possible for students to take this work in the College and to graduate at the same age as now from the Schools of Applied Science, having the degree of Bachelor of Arts and also the technical degree; but, as yet, comparatively few students avail of this opportunity. In the meanwhile, the administration of the Schools of Applied Science has to be tempered by a recognition of the fact that many of the students who are seeking to become specialists in those schools are, after all, of College age. It must be admitted that the disposition towards athletic sports of the Faculty of Applied Science as a whole is not friendly. It seems to the Faculty that they interfere inevitably with the serious pursuit of the purpose for which the schools exist. On the other hand, there is an element, to which the President belongs, that believes there is no theory so perfect that, in its application to human affairs, it does not have to be modified. So long, therefore, as the students in the Schools of Applied Science are, in the earlier years of the course, for the most part of College age, it seems wise, on the whole, to recognize athletic sports as not altogether out of place even in connection with the Schools of Applied Science.

It is evident, however, that if this very natural interest on the part of the students is to be an advantage in their training instead of a disadvantage, it must be under reasonable control on the part of the Faculty. Acting in conformity with these ideas, and upon the authority of the University Council, a Committee on Athletics has been appointed by the President, consisting of Professor Kemp, Chairman, of Dr. Savage, the Director of the Gymnasium, and of Professor Hutton. To this Committee has been assigned the duty of enforcing a few simple rules that are calculated to limit the tendencies to abuse in connection with athletic sports, and, on the other hand, to develop all of their good points. The system allows abundant initiative to the students, but it frankly admits responsibility on the part of the authorities for the conduct of athletics at Columbia University within the lines of the regulations laid down by the Committee on Athletics. It has been already found, in more cases than one, that the desire to take part in athletic contests has been an effective means of securing from a student proper attention to his educational duties which, under different conditions, he might have neglected. In the meanwhile, all universities and colleges with whom teams representing Columbia may hereafter compete, may understand that the good faith of the University itself is engaged to maintain the amateur character and the genuine student standing of all men who may represent Columbia in athletic contests. Mistakes may sometimes be made from lack of knowledge; but there will be no hesitation in withdrawing from a representative position any man who is known to be either only nominally a student or not a bona-fide amateur. If other universities and colleges will take the same stand, it ought to be easy to put an end to many of the evils which have marred intercollegiate athletics in the past.

A single thought in this connection is worthy of consideration by the students as a body. The reputation of Columbia University in athletics does not depend wholly upon those who represent the University on its teams. The bearing of the student body in the presence of victory and defeat has much to do with the regard in which men hold an institution of learning. The student body should strive at all times, in the presence both of victory and of defeat, to manifest a self-restraint that will reveal it as a body which can achieve a victory over itself that is more to be desired even than the triumph of the University teams. Within the lines outlined in this discussion, and so long as it appears that athletic sports at Columbia are, as I believe they can be, a valuable agency in the training of men, I shall be glad to give to them my hearty support.

THE COLLEGE

For the first time in its history, the number of students in the College has exceeded 400. The figures are as follows:

Seniors	53
Juniors	87
Sophomores	89
Freshmen	136
Specials	38
	403
University students taking one or more courses in the College	11
	414

The new curriculum which went into effect upon our removal to the new site continues to give satisfaction. It is still too new to permit of elaborate statistical examination. Reference is asked to the report of the Dean of the College for detailed information in regard to the year. A few comparisons with the corresponding figures of last year may be of interest. Students now enter the College in three groups. All must pass satisfactory examinations in English, Elementary Mathematics, and Latin. In addition to these subjects,

Group I must pass in Greek and French;
Group II must pass in Greek and German;
Group III must pass in one natural science with laboratory work (Chemistry, Physics, or Botany), and in three of the following subjects: French, German, History, Advanced Mathematics.

The following figures show for each of the last two years the number of Freshmen entering in the different groups:

	1897	1898
Group I	51	51
Group II	44	51
Group III	13	24

It would appear, therefore, that in 1897 about 88 % of the class presented Greek for entrance. In 1898 the percentage had fallen to 80 %. It is too early, however, to assume that this will be the uniform tendency. The tendency within the College is to an increase in the number of those who study Greek. Of the 102 Freshmen presenting Greek at entrance in 1898–99, 30 continued to study both Greek and Latin during their Freshman year. It is interesting to note that two of those who entered without Greek began the study of that language during the Freshman year. It should not be forgotten that while a smaller number of students continue the study of Greek under the present curriculum than formerly, those who do study it have opportunities to become familiar with the Greek language and literature far exceeding any which were enjoyed when Greek was a required subject.

The tables relating to entrance examinations are given again, and in comparison with the similar tables of the preceding year.

The first shows the number of candidates for entrance to the College in June, 1898, and June, 1899, who presented themselves for examination in each subject. The second shows the percentage of the number passing in each subject.

	1898		1899	
Total number of candidates	214		173	
English		Per cent.		Per cent.
Reading and Composition	138	65	107	62
Study and Composition	111	52	87	50
Elementary Mathematics				
Algebra	127	59	113	65
Geometry	111	52	100	58
Latin (New Requirements)				
Cicero	7	3.3	75	43
Vergil	7	3.3	58	34
Sight Minor	8	3.7	81	47
Sight Major	2	0.9	38	22
Special Test	6	2.8	72	42
Prose Composition	2	0.9	45	26
Latin (Old Requirements)				
Cæsar	120	56	10	5.8
Cicero	116	54	45	26
Vergil	118	55	28	16
Prosody	116	54	36	21
Grammar and Composition	117	55	49	28
Greek (New Requirements)				
Attic Prose	3	1.4	59	34
Homer	1	0.5	22	13
Prose Composition	1	0.5	22	13
Greek (Old Requirements)				
Anabasis I, II	90	42	14	8.1
Anabasis III, IV	88	41	32	19
Homer	96	45	38	22
Grammar and Composition	99	46	38	22
French				
Translation	88	41	71	41
Grammar	89	42	71	41
German				
Translation	70	33	68	39
Grammar	70	33	69	40
History				
American	3	1.4	30	17
English	2	0.9	22	13
Advanced Mathematics				
Advanced Algebra	12	5.6	13	7.5
Solid Geometry	9	4.2	13	7.5
Physics				
Theory	5	2.3	13	7.5
Laboratory	5	2.3	13	7.5
Chemistry				
Theory	4	1.9	16	9.2
Laboratory	3	1.4	16	9.2
Botany				
Theory	1	0.5	2	1.2
Laboratory	1	0.5	2	1.2

	JUNE, 1898			JUNE, 1899		
	No. taking examinations	No. passing	Percentage	No. taking examinations	No. passing	Percentage
English						
Reading and Composition	138	102	74	107	82	77
Study and Composition	111	87	78	87	65	75
Elementary Mathematics						
Algebra	127	92	72	113	92	81
Geometry	111	101	91	100	86	86
Latin (New Requirements)						
Cicero	7	4	57	75	65	87
Vergil	7	4	57	58	42	72
Sight Minor	8	2	25	81	66	81
Sight Major	2	0	0	38	30	79
Special Test	6	3	50	72	39	54
Prose Composition	2	1	50	45	27	60
Latin (Old Requirements)						
Cæsar	120	110	92	10	9	90
Cicero and Sight Reading	116	66	57	45	38	84
Vergil	118	105	89	28	20	72
Prosody	116	78	67	36	25	69
Grammar and Composition	117	66	56	49	32	65
Greek (New Requirements)						
Attic Prose	3	2	67	59	42	71
Homer	1	0	0	22	19	86
Prose Composition	1	1	100	22	14	64
Greek (Old Requirements)						
Anabasis I, II	90	73	81	14	11	79
Anabasis III, IV	88	60	68	32	21	66
Homer	96	73	76	38	35	92
Grammar and Composition	99	42	42	38	22	58
French						
Translation	88	46	52	71	57	80
Grammar	89	37	42	71	48	68
German						
Translation	70	57	81	68	54	79
Grammar	70	51	73	69	52	75
History						
American	3	2	67	30	28	93
English	2	1	50	22	16	73
Advanced Mathematics						
Advanced Algebra	12	8	67	13	10	76
Solid Geometry	9	6	67	13	11	85
Physics						
Theory	5	5	100	13	12	92
Laboratory	5	5	100	13	10	77
Chemistry						
Theory	4	3	75	16	15	94
Laboratory	3	2	67	16	14	88
Botany						
Theory	1	0	0	2	2	100
Laboratory	1	0	0	2	1	50

During recent years, a considerable number of students have obtained admission to Columbia College in all of the classes by transfer from other colleges. There were admitted in this way, to the

	1895	1896	1897	1898
Freshman Class	3	3	7	5
Sophomore Class	7	3	5	7
Junior Class	4	3	3	8
Senior Class	6	2	4	1
Special Student				1
	20	11	19	22

The privilege of shortening the combined college and professional course by counting the first year in the professional schools as a partial fulfilment of the requirement for the Bachelor of Arts degree, is not open to students who enter Columbia College later than the beginning of the Junior year. All transfers to the Senior class, therefore, are of men who propose to pursue during that year a course of non-professional studies. On the other hand, it does not follow that all who are transferred to Columbia College at or before the beginning of the Junior year seek such a transfer simply for the purpose of shortening by one year their combined college and professional course. There is no evidence to show that any larger proportion of such students avail of this privilege than of those who enter the College at the beginning of the Freshman year.

The following table relating to the geographical distribution of the College students is not without interest.

	1897–98	1898–99
Number of States represented	16	20
Foreign countries	1	1
Attendance outside the city of New York	111	128

I continue the table, showing the number of Columbia Bachelors of Arts who remain students in the University after graduation from the College. For the first time in a number of years, the falling off has been considerable. It probably reflects the graduation from the College of several small classes in succession.

1893–94	55
1894–95	68
1895–96	74
1896–97	80
1897–98	75
1898–99	63

The following table shows the number of Seniors electing courses under one faculty alone, and those electing courses under more than one faculty.

	Studying under one Faculty	Studying under two Faculties	Studying under three Faculties
1891–92	3	20	15
1892–93	15	38	12
1893–94	31	45	7
1894–95	8	38	11
1895–96	15	21	15
1896–97	12	24	17
1897–98	5	26	18
1898–99	4	34	15

I call attention again to the great importance of securing at as early a day as possible, a permanent building for the College. It is greatly to be desired that some alumnus, or some citizen who is interested in such things, should give to the Trustees the funds necessary for this purpose. The building is to stand on the corner of 116th Street and Amsterdam Avenue. The estimated cost of a suitable building is $300,000. Anyone who will contribute such a building will do much to improve the work of the College, besides adding to the appearance and dignity of the important group of buildings which already do so much to adorn the city of New York.

THE SCHOOL OF LAW

The most important action affecting the School of Law taken by the Trustees since the reorganization of the School in 1891, is embodied in the following resolution passed at the meeting held January 9, 1899:

> *Resolved*, That, on and after June 30th, 1903, admission to the Law School be limited to students who have already taken their first degree.

As embodied in the Statutes of the Trustees, this resolution means students who have already taken their first degree or have had an equivalent preliminary education. The proportion of such students in the School of Law at the present time, and as it has been for the last two years, is 63 %. If admission to the Bar were dependent upon the obtaining of a degree in law from some recognized law school, it would be injudicious to limit the attendance upon the School of Law to those who have had the advantages of thorough preliminary education; but, inasmuch as admission to the Bar can be had without any degree at all, it appears to be desirable that there should be a few schools of law in the country where education in law can be had under the best possible conditions. A class made up entirely of men who have had the advantage of broad preliminary training can be carried much further in the same length of time than a mixed class. It is readily granted that there is room in the country for many law schools which make no such requirement. Indeed it would be a misfortune to the country if there were no such schools. On the other hand, it seems equally clear that an endowed university discharges its full duty to the profession only when it offers to those who can profit by them the best possible facilities for preparation to practise the profession. When the enjoyment of such facilities is seen to depend upon a broad preliminary preparation, the influence of such a requirement upon the standard of the profession is certain to be advantageous in the extreme.

At the end of the year, Prof. Henry W. Hardon retired from the chair which he has filled for three years, in order to resume the practice of the law. Professor Hardon takes with him the high regard and good wishes of every member of the Faculty. He has been succeeded by Prof. John W. Houston, formerly a member of the firm of Cravath & Houston, from which firm he retired in order to devote himself to the teaching of the law.

Under the will of the late Charles Bathgate Beck, the Treasurer has received the sum of $8000 for the purpose of establishing a prize to be awarded to the student passing the best examinations on the subject of Real Property. In conformity to this bequest, the Trustees have established the Charles Bathgate Beck Prize Scholarship in the School of Law, which is open to competition, at the end of the first year, to students of the First Year class who have acquitted themselves creditably in all subjects. The student in this group who passes the best examination on Real Property will be awarded the scholarship, the income of which is sufficient to pay his tuition fee during the remainder of the course.

The usual statistics in regard to the School of Law are given herewith.

	1895–96	1896–97	1897–98	1898–99
Men holding Columbia degrees.	29	32	35	23
Men holding other degrees.....	140	180	193	194
	169	212	228	217
Columbia College Seniors.....	10	6	9	5
	179	218	237	222
Percentage of the whole School	51 %	60 %	63 %	63 %
Total number in School.......	333	363	376	349

The falling off in numbers reflects our removal to the new site. I am glad to be able to add, in anticipation of next year's report, that the incoming class of 1899–1900 is already larger by 32 than the class which entered in the year under review. An unusually high percentage of upper classmen have also returned to the School, so that its membership in 1899–1900 is likely to be the largest since its reorganization.

THE COLLEGE OF PHYSICIANS AND SURGEONS

The year 1898 was marked by the opening in the city of New York of a medical school attached to Cornell University, whose main activity is centred at Ithaca. The Faculty of the Cornell Medical School is, to a large extent, identical with the former Faculty of the New York University Medical School. On the other hand, the New York University has absorbed the Faculty of the Bellevue Medical School. This re-distribution of medical-school teachers leaves the city, so far as the Borough of Manhattan is concerned, with three undergraduate schools of medicine, as before. It is probable that the New York University Medical School, and the Cornell Medical School, together, will offer a stronger competition to the College of Physicians and Surgeons in the new form than our medical school had to contend with under previous conditions. So far as this indicates improved opportunities in the city for the study of medicine, it is to be heartily welcomed; and there is no surer way of keeping the work in the College of Physicians and Surgeons up to the highest level. The first effect of the new situation was to reduce the number of students at the College of Physicians and Surgeons by 40. The entering class, in particular, was reduced from 220 to 194. I am happy to be able to add, again in anticipation of next year's report, that this effect has been entirely temporary. The entering class of 1899 numbers 226, which is the second largest class to enter since the establishment of the four years' curriculum.

A very interesting endowment, amounting to $50,000, was made in behalf of the College of Physicians and Surgeons. A gentleman who wished to make a memorial of his wife, and who also desired to pay a tribute to Dr. Abraham Jacobi, presented to the Trustees the sum of $50,000 for the maintenance of the Abraham Jacobi Ward for Children in the Roosevelt

Hospital. By the terms of the gift, ratified by an agreement between the University and the Hospital, the income of the fund is turned over to the Roosevelt Hospital for the support of a ward for children containing 12 beds. It is a condition of the gift that the ward shall be used for purposes of instruction for the benefit of students in the College of Physicians and Surgeons. The physician to have charge of the ward is appointed by the Trustees of the Hospital, upon nomination by the Medical Faculty. The first incumbent is Dr. Abraham Jacobi himself. The result of the year's work under these new conditions was so satisfactory as to call forth spontaneously from the students resolutions of appreciation, which were presented by them to Dr. Jacobi at the end of the year.

During the year, Mr. and Mrs. William D. Sloane transferred to the University the building erected, enlarged, and endowed by them, known as the Sloane Maternity Hospital. Completely furnished and equipped, it represents an expenditure of $526,300.29. It is provided with an endowment amounting to $373,300. Mrs. Sloane undertakes to make good the deficiency, if there be any, year by year, while she lives, and in her will to provide an adequate endowment for the maintenance of the enlarged Hospital. This munificent gift in the cause of humanity and of medical education affords unsurpassed opportunities to the students of the College of Physicians and Surgeons for instruction in obstetrics, and also to nurses from several schools for training in the same subject. The enlarged building came into use this year. Mr. and Mrs. Sloane are to be congratulated upon having made this great gift in a form that will not only minister to those who receive care in the Hospital, but that will also, for generations to come, train physicians and nurses for better service all over the land.

The usual statistics in regard to the College of Physicians and Surgeons are given herewith.

	1895–96	1896–97	1897–98	1898–99
Men holding Columbia degrees.	19	19	35	29
Men holding other degrees.....	246	221	284	274
	265	240	319	303
Columbia College Seniors......	6	3	3	4
	271	243	322	307
Percentage of the whole School	38	38	42	42
Total number in School.......	709	639	766	726

The proportion of students entering the School with a thorough preliminary education is shown by the following table:

	Degrees signifying a liberal education	Degrees signifying a technical education	Percentage in class of liberal degrees
1895–96..............	68	3	28
1896–97..............	73	3	28
1897–98..............	81	4	39
1898–99..............	56	9	34

Although the percentage in the class of liberal degrees has fallen off, it is still considerably larger than that of the first two classes to enter under the long curriculum.

In my last report, I called attention to the appointment of Dr. Edwin B. Cragin, as Lecturer in Obstetrics. I am happy to be able to say that he has now received the appointment as Professor of Obstetrics, which makes him a member in full standing of the

Medical Faculty. As a consequence, Dr. Cragin has retired from the office of Secretary of the Faculty, in which office he has been succeeded by Dr. F. J. Brockway.

The work of the first year in the Department of Physiological Chemistry under the Directorship of Prof. Chittenden has been so satisfactory that the Medical Faculty passed a series of resolutions in regard to it, expressive of their high appreciation of Prof. Chittenden's services in this connection.

The Statutes have been amended during the year so as to place the medical students on the same basis, in the matter of the payment of fees, as other students of the University. When the College of Physicians and Surgeons became a part of the University, it had been the custom in the Medical School to collect the entire fee at the beginning of the year. This custom has been continued until now in response to the preference of the Medical Faculty. By the action alluded to, however, which has been taken with the approval of the Medical Faculty, the medical student enjoys now the same privilege as other students of the University of paying his fee in two parts, one half at the beginning of the year and the other half in February.

Upon the recommendation of the Medical Faculty, the Trustees created a scholarship for the academic years 1898–99 and 1899–1900, known as the O'Dwyer Scholarship, "in memory of Dr. Joseph O'Dwyer's distinguished services to the medical profession and the cause of humanity in the invention and perfection of the process of intubation of the larynx." This scholarship has been awarded to the eldest son of the late Dr. O'Dwyer. This action has seemed to everyone to be a graceful recognition on the part of the University of distinguished service to humanity. Dr. O'Dwyer might have patented his process and have made it a source of considerable wealth. He preferred, on the other hand, to give the benefit of his discovery to mankind. Such a spirit deserves the heartiest admiration and recognition.

THE SCHOOLS OF APPLIED SCIENCE

I am happy to report again an increase in the attendance upon these schools. The following figures show the attendance by classes and by courses.

	1st Class	2d Class	3d Class	4th Class	Total
SCHOOL OF MINES :					
Mining Engineering.....	31	21	10	5	67
Metallurgy.............	0	0	1	0	1
SCHOOL OF CHEMISTRY....	10	10	9	5	34
SCHOOL OF ENGINEERING :					
Civil Engineering.......	26	15	11	9	61
Electrical Engineering..	53	39	25	18	135
Mechanical Engineering.	30	8	0	0	38
SCHOOL OF ARCHITECTURE	40	25	7	5	77
	190	118	63	42	413

Candidates for the degree of Master of Arts.......	14
Candidates for the degree of Doctor of Philosophy.	2
Special students..............................	38
Making a grand total of..........	467*
	8
	459

Making a comparison by courses with the preceding year, the result is as follows :

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* Eight of this number were also students in regular undergraduate courses.

	1897–98	1898–99
SCHOOL OF MINES:		
Mining Engineering	57	67
Metallurgy	3	1
SCHOOL OF CHEMISTRY	35	34
SCHOOL OF ENGINEERING:		
Civil Engineering	75	61
Electrical Engineering	141	135
Mechanical Engineering	14	38
SCHOOL OF ARCHITECTURE	76	77
	401	413

From these figures, it appears that the principal growth has been in Mining Engineering and in Mechanical Engineering. There is a considerable falling off in Civil Engineering, due to the graduation in 1898 of an unusually large class. There is a falling off of six in Electrical Engineering. This may be due to the development of the course in Mechanical Engineering. This course is now in its second year. In the first year it had fourteen students, and in the second year, thirty-eight.

In order to be ready for the development of the course of Mechanical Engineering in its third year, William Ledyard Cathcart, a graduate of the engineering course in the Naval Academy, has been appointed Adjunct Professor of Mechanical Engineering. He begins active service in the academic year 1899–1900. Professor Cathcart, when called to Columbia, was serving as Professor of Marine Engineering in Mr. William H. Webb's Academy at Fordham Heights. It is hoped that before many years the course in Mechanical Engineering may be developed so as to include among its other alternatives one that will give special attention to marine engines. In that event, Professor Cathcart's connection with the Department will be of especial value.

By a special vote of the Trustees, Prof. Richards, Professor of Manual Training in Teachers College, has been invited to sit with the Faculty of Applied Science, with a vote as to all questions affecting the shop work of students in the School of Engineering. Instruction in shop work is given in the shops of Teachers College, and these are under the control of Prof. Richards. His assignment to a seat in the Faculty of Applied Science, therefore, is both natural and advantageous.

During the absence on leave of Prof. Crocker, his place was partially filled by Prof. William A. Anthony, Ph.B., as Lecturer in Electrical Engineering. Professor Anthony discharged the duties of this position very acceptably, and it gives me pleasure to record my high appreciation of his work.

In 1897, the University received from the estate of the late William C. Illig, a graduate of the Class of 1882 in the School of Mines, the sum of $2000, the income of which is to be used for the preparation of medals to be granted to especially meritorious students in the Schools of Applied Science. After careful discussion, it has been decided that these medals shall be awarded on the basis of the record made by students during the whole four-year course. The Faculty of Applied Science is strong in its conviction that prizes for special excellence in given subjects tend to divert students from that well-considered attention to the whole of their work which is necessary to produce the best results. This feeling is shared by every faculty in the University. An examination of the subject by the Committee on Education of the Trustees resulted in the adoption of a report to the effect that the establishment of prizes for special, as distinguished from general excellence, should be discouraged.

The late Willard B. Perkins, of Lawrence, Mass., left a legacy to the University of $6000 for the purpose of establishing the Perkins Fellowship in Architecture. The income is to be expended every four years for a travelling fellowship. After deducting the inheritance tax, the fund, as received, amounts to $5700. The bequest is especially interesting, because Mr. Perkins is not known to have had any special interest in the Architectural School of Columbia. He was interested in the subject of architecture, and provided in his will for the establishment of fellowships in several schools, among them our own.

Many friends have united to make possible the installation of the locomotive "Columbia" in the Department of Mechanical Engineering. The thanks of the University have been extended to all. This beautiful gift from the Baldwin Locomotive Works, as at present installed, is not only an interesting object, but it promises to be of great scientific value. It was one of the conditions of the gift that it should be so mounted as to be used for making tests. It can be operated either by its own steam, by steam from the boilers, or by compressed air; and in all conditions of operation tests of every desired kind can be made.

The usual table is appended showing the number of students holding degrees in the Schools of Applied Science.

	1895–96	1896–97	1897–98	1898–99
Men holding Columbia degrees	10	11	13	13
Men holding other degrees....	35	42	40	59
	45	53	53	72
Columbia College Seniors.....	5	11	2	2
	50	64	55	74
Percentage of the Schools.....	14	16	12	16
Total number in the Schools..	347	399	429	459

The following table relates to entrance examinations and was given last year for the first time.

	1898		1899	
Total number of candidates..............	187		204	
Mathematics		*Per cent.*		*Per cent.*
Algebra (*a*)........................	127	68	140	69
" (*b*)........................	101	54	85	42
Geometry (*a*)......................	118	63	135	66
" (*b*)......................	101	54	87	43
Trigonometry......................	99	53	85	42
Physics				
Theory............................	102	55	99	49
Experiments......................	74	40	82	40
Chemistry				
Theory............................	99	53	107	52
Experiments......................	64	34	96	47
English				
Reading and Composition...........	138	74	127	62
Study and Composition..............	101	54	84	41
French				
Grammar..........................	121	65	105	51
Translation.	121	65	99	49
German				
Grammar..........................	103	55	108	53
Translation........................	103	55	104	51
History.............................	110	59	130	64
Drawing				
Freehand..........................	93	50	100	49
Architectural......................	18	10	13	6.4
Latin...............................	..	..	5	2.5

	June, 1898			June, 1899		
	No. taking examinations	No. passing	Percentage	No. taking examinations	No. passing	Percentage
Mathematics						
Algebra (*a*)	127	90	70	140	105	75
" (*b*)	101	68	67	85	69	81
Geometry (*a*)	118	91	77	135	98	73
" (*b*)	101	64	63	87	57	66
Trigonometry	99	53	54	85	47	55
Physics						
Theory	102	97	95	99	87	88
Experiments	74	52	70	82	72	88
Chemistry						
Theory	99	54	55	107	103	88
Experiments	64	63	98	96	92	96
English						
Reading and Composition	138	85	62	127	82	65
Study and Composition	101	67	66	84	64	76
French						
Grammar	121	31	26	105	28	27
Translation	121	69	57	99	65	66
German						
Grammar	103	49	48	108	60	56
Translation	103	80	78	104	62	60
History	110	62	56	130	83	64
Drawing						
Freehand	93	79	85	100	68	68
Architectural	18	9	50	13	8	62
Latin	..	..	..	5	2	40

THE SCHOOL OF POLITICAL SCIENCE

The Dean of this Faculty reports again that the character and quality of the work which the professors are able to do under the physically ideal conditions enjoyed at the new site is constantly improving. No incident of note marked the work of the year except the return to duty, at the beginning of the second term, after the completion of his work for the government incidental to the Spanish-American War, of Prof. John Bassett Moore, the Hamilton Fish

Professor of International Law and Diplomacy. During the first term, Prof. Moore's work in International Law was acceptably conducted by Edmond Kelly, Esq. ; and his work in Diplomacy, by Frederic Bancroft, Ph.D.

The usual statistical figures relating to the School of Political Science are presented herewith. They seem to call for no special comment.

	1895–96	1896–97	1897–98	1898–9
Men holding Columbia degrees	38	31	40	40
Men holding other degrees....	197	163	180	128
	235	194	220	168
Columbia College Seniors.....	37	34	33	37
	272	228	253	205
Percentage of the whole School	73	62	82	85
Total number in the School...	346	366	310	240

THE SCHOOL OF PHILOSOPHY

The work of this school has proceeded smoothly and successfully. By the kindness of a friend, provision has been made, for two years, for the salary of a Professor of Anthropology. The chair thus provided for has been added to the Department of Psychology, so that the Department has become the Department of Psychology and Anthropology. Dr. Franz Boas, who has served for a number of years as Lecturer on Anthropology, has been appointed to the chair of Anthropology with the title of Professor.

In further extension of the policy of coöperation between Teachers College and the University, Prof. Russell, the Dean of Teachers College and Professor of the History of Education, and Prof. McMurry, Professor of the Theory and Practice of Teaching in Teachers College, have been assigned to seats in the Faculty of Philosophy, with a vote as to all questions affecting Teachers College.

Interesting provision has been made for the extension of the work in music. With the beginning of the academic year 1899, the personnel of the Department, which has heretofore consisted of Professor MacDowell and one assistant, will consist of Professor MacDowell, a tutor, and a conductor in music. The conductor in music is to train the Columbia Orchestra and the Columbia Chorus, bodies whose membership consists of students of the University. This is an important step in the direction of making music a larger factor in the life of the University. Heretofore, this work has been conducted upon an amateur basis, by such leaders as the organizations themselves could employ. Hereafter, it will be systematically carried on under the direction of the Department of music. The effect cannot be otherwise than important upon the musical activities of the University. At the same time, the scientific instruction in the musical courses will be maintained with increased efficiency. These courses continue to attract an increasing number of students year by year.

The Hon. Oswald Ottendorfer has given the sum of $1000 as the beginning of a fund to maintain a permanent course of public lectures at the University in the German language. This is all the more welcome because Mr. Ottendorfer has shown himself so often a friend of the University.

The usual statistics in regard to the School of Philosophy follow :

	1895-96	1896-97	1897-98	1898-99
Men holding Columbia degrees.	25	38	51	53
Men holding other degrees.....	122	99	121	144
	147	137	172	197
Columbia College Seniors......	44	53	38	42
	191	190	210	239
Percentage of the whole School.	84	72	82	74
Total number in the School....	227	263	255	321

THE SCHOOL OF PURE SCIENCE

This Faculty continues to strengthen its foundations and to improve the quality of its work year by year. Only a few incidents seem to demand special notice. The Department of Astronomy has been greatly strengthened by the course of lectures on celestial mechanics offered by Dr. George W. Hill. This course is made possible by the liberality of Miss Catherine W. Bruce, reported to the Trustees a year ago. The Department of Astronomy at Columbia has never been able, by reason of the atmospheric conditions prevailing in the city of New York, to enjoy the advantages of a great observatory. Until the removal of the University to the new site, however, it did have an observatory well enough equipped to permit it to give much valuable instruction in the use of astronomical instruments. Such an observatory, at least, it ought to have again at the earliest possible day. A temporary building has been erected on the Green which permits the use of the transit instrument, and this, in connection with the small building close by, which was erected a few years ago for the purpose of observations taken for the determination of the variation of latitude, gives to the Department the only privileges for observational work which it now has. It need not be pointed out how meagre these are. If there is any one in this community who is especially interested in astronomy, he cannot easily do more for the science, with a comparatively small sum, than to give to this Department a teaching observatory. In the meanwhile, the Department, under the intelligent guidance of Prof. Rees, has been developing constantly, for a number of years, more and more in the direction of mathematical astronomy. In this field it has obtained for itself an enviable reputation. From Miss Catherine W. Bruce the Department has received, during the year, two gifts : one of $2500 and another of $10,000. The former sum is to be used in building a Polar telescope to be mounted at Helsingfors, Finland, for the purpose of photographing the stars about the north pole ; and also in paying for the measurement and reduction of the plates so obtained under the direction of Prof. Jacoby at Columbia University. The latter sum is to be used for the "measurement and reduction of astronomical photographs." I cannot too highly commend the good judgment of the Professor of Astronomy in wresting from the disadvantages of his position in the city of New York a development which has given to his Department exceptional importance in all astronomical circles both at home and abroad. This is typical of what ought to be the policy of the University at every point ; that is to say, to do especially the things that can be exceptionally well done in the city of New York, and not to attempt to do in particular what can be better done elsewhere. Mr.

Rutherfurd Stuyvesant has again contributed $1000, as he has done annually since 1893, for reducing the measurements on the photographic plates given to the University by his father, the late Lewis M. Rutherfurd. These plates have especial value because they were taken when celestial photography was in its infancy.

When the Department of Zoölogy was established, Prof. Osborn was appointed at its head. From the beginning, he has had the hearty coöperation of Prof. E. B. Wilson. At the end of the academic year 1898–1899, Prof. Osborn, by his own request, retired from the administrative conduct of the Department, and was succeeded by Prof. Wilson. Prof. Osborn continues to give the graduate courses which he has given hitherto, but he has asked to be relieved from the administrative work in order that he may command more time for investigation and writing. The University is fortunate in having in the Department a man so competent to assume charge of it as Prof. Wilson. In the meanwhile, it is a pleasure to make formal recognition here of the important service which Prof. Osborn has rendered to the University by the organization of this Department and by its conduct up to this time. The Department has always been a source of pride to the University, and its standing was never higher than now.

An interesting feature of the year was the delivery at Columbia, under the auspices of the Department of Zoölogy, of a course of ten lectures on "The Foundations of Zoölogy," by Prof. William Keith Brooks, of Johns Hopkins University. Prof. Brooks is one of the fathers of the science in the United

States, and it is gratifying that these lectures, which sum up the result of his investigations and reflection for a long period of years, should have been given to the world under the auspices of Columbia University. They have since been published by the Columbia University Press under the title "Foundations of Zoölogy." They form a notable addition to the body of American literature on the subject of biology.

The Zoölogical Expedition fitted out by the generosity of Mr. Senff was under the charge of Nathan R. Harrington. Its destination was the Upper Nile, where it hoped to secure the embryos of a certain fish called Polypterus. At every point in its journey the expedition received the greatest kindness at the hands of the British officials in Egypt and of British scientific men. It reached Atbara, its place of destination, in safety; but it had hardly begun its search before Dr. Harrington was stricken with the Nile fever, of which he died after a short illness. The remaining members of the expedition, Dr. Reid Hunt and Mr. Francis B. Sumner, continued at their posts and made a valuable collection of specimens. They have not, however, succeeded in finding that for which they went. In the meanwhile, an English investigator by the name of J. J. Budgett, who has been at work for some time on the western coast of Africa, has just been rewarded by finding that for which we have sought so long. It is in ways like this that men of science contribute to our knowledge of the world in which we live. Dr. Harrington deserves to be remembered as a real martyr to the cause.

Four other gifts in the interest of zoölogy remain to be spoken of. The Dyckman fund of $10,000 for the Encouragement of Biological Research was established by the late Isaac Michael Dyckman very shortly before his death, in memory of his uncles, Dr. Jacob Dyckman and Dr. James Dyckman, both graduates of the College of Physicians and Surgeons, the first in the Class of 1810 and the second in the Class of 1811.

Miss Susan Dyckman has also given $200 for a scholarship in zoölogy during the past summer. The Wawepex Society has continued for another year the John D. Jones Scholarship in Zoölogy, by the payment of $200.

A collection of shells, valued at $3000, has been received from Mrs. Henry D. Van Nostrand. The collection contains about 6500 species, many of great interest and value. The collection was made by Mrs. Van Nostrand's husband, who began the collection more than forty years ago.

Upon the suggestion of Prof. Rood, the title of Prof. R. S. Woodward has been changed from Professor of Mechanics to Professor of Mechanics and Mathematical Physics. The change of title is intended to be a recognition of Prof. Woodward's eminence in the important field of mathematical physics. Coming from our Professor of Physics, the suggestion was singularly graceful. It is pleasant to record, in this connection, that Prof. Woodward has been elected, for the coming year, the President of the American Association for the Advancement of Science.

The usual statistics follow, as to the School of Pure Science.

	1895–96	1896–97	1897–98	1898–99
Men holding Columbia degrees	8	22	21	19
Men holding other degrees....	24	61	72	77
	32	83	93	96
Columbia College Seniors....	24	24	9	20
	56	107	102	116
Percentage of the whole School	66	72	55	60
Total number in the School ...	85	149	184	194

MISCELLANEOUS STATISTICS

Table showing attendance of students upon the University as a whole and without regard to schools.

	College Undergraduates	Graduates	Non-Graduates	Total
1890–91........	272	556	920	1748
1891–92........	298	460	812	1570
1892–93........	296	497	847	1640
1893–94........	271	575	958	1804
1894–95........	252	649	1041	1942
1895–96........	262	659	950	1877
1896–97........	307	672	942	1921
1897–98........	335	805	1017	2151
1898–99........	403	801	1004	2208

DEGREES CONFERRED IN 1898–99

Bachelor of Arts..............................	59
" " in Barnard College	21
Bachelor of Laws..............................	92
Doctor of Medicine...........................	140
Engineer of Mines	8
Civil Engineer................................	14
Electrical Engineer..........................	25
Metallurgical Engineer.......................	1
Bachelor of Science..........................	20
Master of Arts................................	83
Doctor of Philosophy.........................	34
Master of Arts (Honorary)	1
Master of Science (Honorary)................	2
Doctor of Laws (Honorary)	2
	502

DEGREES HELD BY STUDENTS

Bachelor of Arts	527	
“ “ Literature	13	
“ “ Philosophy	41	
“ “ Sacred Theology	1	
“ “ Science	131	
Certificate of U. S. Naval Academy	2	
Doctor of Philosophy	8	
Master of Arts	111	
“ “ Laws	1	
“ “ Science	12	
Testimonium Maturitatis	1	
Degrees signifying a liberal or general education.		848
Bachelor of Agriculture	1	
“ “ Divinity	5	
“ “ Laws	13	
“ “ Pedagogy	2	
Civil Engineer	6	
Doctor of Medicine	27	
Doctor in Pharmacy	1	
Electrical Engineer	4	
Graduate in Pharmacy	15	
Master of Mechanical Engineering	1	
Mining Engineer	7	
Veterinary Surgeon	1	
Degrees signifying a technical education		83
Degrees		931
Students holding more than one degree		130
Total number of students holding degrees		801

NUMBER OF INSTITUTIONS REPRESENTED BY GRADUATE STUDENTS

	AMERICAN INSTITUTIONS	FOREIGN INSTITUTIONS
1894–95	136	26
1895–96	136	23
1896–97	145	14
1897–98	151	18
1898–99	139	15

INSTITUTIONS REPRESENTED BY FIVE GRADUATES OR MORE

	1897–98	1898–99
Alfred University, N. Y.	3	6
Amherst College, Mass.	21	22
Bates College, Me.	5	3
Brooklyn Polytechnic Institute	10	2
Brown University, R. I.	17	13
Colgate University, N. Y.	6	6
College of the City of New York	88	104
College of Pharmacy, N. Y.	16	14
Columbia University, N. Y.	136	129
Cornell University, N. Y.	8	13
Dartmouth College, N. H.	5	4
Harvard University, Mass.	73	71
Hobart College, N. Y.	8	8
Holy Cross College, Mass.	5	2
Indiana University	1	6
Johns Hopkins University, Md.	6	7
Lafayette College, Pa.	6	5
Leland Stanford Junior University, Cal.	12	21
Manhattan College, N. Y.	9	7
New York University	12	22
Oberlin College, O.	4	5
Princeton University, N. J.	57	41
Roanoke College, Va.	5	4
Rutgers College, N. J.	10	9
St. Francis Xavier College, N. Y.	21	26
Seton Hall College, N. J.	5	3
State University of Iowa	1	5
Trinity College, Conn.	15	14
University of California	1	6
University of Michigan	10	9
University of Minnesota	7	6
University of Nebraska	1	5
University of Rochester, N. Y.	7	3
University of Toronto, Canada	5	1
University of Vermont	8	4
University of Wisconsin	9	6
Wabash College, Ind.	2	6
Wesleyan University, Conn.	8	12
Williams College, Mass.	24	27
Yale University, Conn.	77	82

GIFTS

The University has been singularly favored with gifts during the year both for current uses and for permanent endowment. Many of the gifts, by reason of their character, have significance that makes them doubly welcome. The gifts may be summarized as follows:

For current uses:		
Salaries		$17,500 00*
Lectures		950 00
Fellowships		2,000 00
Scholarships		424 76
Prizes		200 00
For Purchase of Books		14,821 83
For equipment:		
Mechanical Engineering	$1,800	
Mining Engineering	950	
		$2,750 00
Supplies		973 55
For departmental purposes:		
Mineralogy	$200	
Mining	225	
		$ 425 00
Senff Zoölogical Expedition		5,000 00
Sundries		1,499 19†
General Guarantee Fund, 1898–99		25,250 00
General Guarantee Fund, 1899–1900		2,000 00
Total		$73,794 33

FOR PERMANENT ENDOWMENT

Remainder of Beck Legacy	$ 7,500 00
From Beck Estate, on account of residuary interest,	40,000 00
From Fayerweather Estate—final payment	9,944 77
From Estate of Willard B. Perkins, for Architectural Scholarship	5,700 00
For Abraham Jacobi Ward for Children	50,000 00
Waring Municipal Fund	100,000 00
George William Curtis Fellowship Fund	10,000 00
Carried forward	$223,144 77

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* From Barnard College, for support of three professorships, $12,000.

† From a friend, for general purposes, $1000.

Brought forward	$223,144 77
Dyckman Fund for the Encouragement of Biological Research	10,000 00
Seidl Fellowship	12,000 00
From Miss Catherine W. Bruce, for Department of Astronomy	10,000 00
From Alexander Coles, Class of '85, College	1,500 00
On account of the Construction of the Library	150,639 32
Interest to June 30, 1899, on account of advances made by the Trustees for the Library	75,000 00
From W. C. Schermerhorn, on account of Schermerhorn Hall—final payment	8,133 18
Total	$490,417 27

The University has been made the custodian of several funds of more than usual interest. Immediately after the death of the late Col. George E. Waring, whose work as Commissioner of Street Cleaning in the city of New York during the administration of Mayor Strong gave to him so great a reputation, a movement was started by the New York Chamber of Commerce to raise a fund which should provide a permanent memorial of him. Colonel Waring died of yellow fever caught in Havana in the discharge of a duty undertaken at the request of the President of the United States. This circumstance, taken in connection with the great service he had rendered to the city of New York, not merely by cleaning the streets of the city and by demonstrating that they could be kept clean, but also by illustrating in conspicuous fashion the advantage to the city of having its departments administered with an eye single to the public good, enabled the Committee of the Chamber, with little difficulty, to raise the sum of $100,000. This Committee, upon its own motion, proposed to make the University the custodian of the fund, upon an agreement to pay the income to the widow and daughter of Colonel Waring, respectively, during their lives, and thereafter to devote the income to instruction in municipal affairs. It need scarcely be said that the Trustees accepted the trust most gladly.

Closely in line with this was the establishment of a fellowship in memory of the late George William Curtis. This fellowship is to be used " to encourage the study of the science of government, with a special view to its application to the then existing condition of the United States or of the State or City of New York." The incumbent of the fellowship is to publish a monograph embodying the result of his studies, and in connection therewith to give an outline of the life and services of the late Mr. Curtis.

Still another evidence of the growing disposition in the city to make Columbia its agent for such purposes is shown by the creation of the Seidl Fellowship in Music. The friends of the late Anton Seidl held a concert shortly after his death, for the purpose of providing a fund for the benefit of his widow. The sum of $12,000 was secured. At the request of Mrs. Seidl, this sum has been given to the University. During her lifetime, the interest is to be paid to her and afterwards to be used to support the Anton Seidl Fellowship in Music.

The friends of the Hon. Carl Schurz determined to celebrate his seventieth birthday, which occurred last spring. A complimentary dinner was given to Mr. Schurz and he was made the recipient of many resolutions and addresses. But some of his friends, desiring to mark the record of his useful life in a more permanent way, exerted themselves successfully to raise a fund of $20,000, to be presented to the University and to be known as the Carl Schurz Fund. The income of one half of this sum is to be used in supporting a fellowship in German: and the income of the other half is to be used for the development of the Germanic section of the library.

The University may well think itself fortunate to be chosen to perpetuate the names of Waring, of Curtis, of Seidl, and of Schurz. These names are, and will remain, an inspiration for generations. Those also are to be congratulated who have selected the University to perpetuate the names and the services of those whom they desired to honor. For such memorials are likely to endure for centuries, and as long as they endure they are a constant source of benefaction. With the exception of one or two churches, there is no organization in the city of New York as old as Columbia, and Columbia, from the point of view of a university, is still very young. Universities are yet active that have celebrated their 500th anniversary.

Two legacies of $15,000 each have been left to the University by Alexander Moncrief Proudfit, of the Class of 1892. One of these is for the endowment of the Alexander Moncrief Proudfit Fellowship for the Encouragement of the Study of English Literature; the other for the endowment of the Maria McLean Proudfit Fellowship for the Encouragement of Advanced Studies in Medicine.

One of the most interesting gifts of the year was that of $1500 from Alexander Coles, of the Class of '85. Mr. Coles, having had the benefit of free tuition as a student, sends this sum as a slight recognition of the benefits he has derived from the College.

Certain other gifts, not taking the form of money, call for grateful recognition. The Holland Society provided for the delivery of a course of six lectures on Dutch Literature, by Leonard Charles Van Noppen, A.M. This is the beginning of what I hope may prove to be a long-continued coöperation between the Holland Society and the University for placing proper emphasis upon the relation of the Dutch to the City and State of New York. Certainly no object could be more appropriate either for the Society or for the University.

Through the kindness of Mr. James H. Hyde, a course of fifteen lectures upon life insurance was delivered by Charlton T. Lewis, Esq.

Our friend and alumnus, Dr. J. Ackerman Coles, adorned the library still further by the gift of a beautiful bronze bust of Cicero.

Dr. Egleston has presented to the School of Mines his collection of minerals and a large part of his library. Both the minerals and the books are not only welcome as souvenirs of Dr. Egleston, but they are actually of great value and use.

NEEDS

A university, like any live organism, must constantly grow. No matter what its resources, therefore, it must always stand in need of enlargement. A university that is alive and fully up to the times will always be in need. The more it has, the more it can do. Every addition to its strength not only increases but multiplies its power. As long as Columbia is obliged to meet a large debit account for interest payable, as an incident of removal to the new site, there is no form in which help can be given to it so serviceable as one of the many forms which help it to carry this charge. Contributions to the Guarantee Fund help to accomplish this purpose. Any increase of its resources which provides free income accomplishes the same result. Nothing more helpful in this direction can be done than to provide it with dormitories; for dormitories will not only increase its income directly by whatever they may produce, but they will also increase the student membership of the University, and thus enlarge its income derived from fees. It is greatly to be hoped that gifts for this purpose will be made during the present academic year.

Next to this, I place the need of a Chapel and of a new building for Columbia College. I have touched upon the importance of these needs in other parts of this report.

A noble memorial awaits the man who will complete the University Building, a model of which is to be seen in the Metropolitan Museum of Art. The upper part of this structure is to be devoted especially to the academic theatre and to the Memorial Hall, which is also to be the dining-hall of the University. The Memorial Hall is to be provided by the alumni of the University; but that will be merely a detail of the building. The structure itself will be not only noble in its proportions and very beautiful, but it will also be associated with all the public functions of the University.

There is also greatly needed, on the western side of the grounds, a building which shall be the headquarters of the social life of the students. The University of Pennsylvania has been fortunate in receiving the gift of such a building, which is known as Houston Hall. I gather that there is no more valuable adjunct to the life of the University than this building. Such a building should also give accommodation to all of the student organizations. It would thus add immensely not only to the pleasure of the student's life, but also to the training value of his experience as a student.

It is rather a noticeable circumstance that two buildings have been given for the advancement of pure science, while only one has been given for the study of the applied sciences. When it is considered that it is the application of scientific laws which produces wealth, rather than the discovery of them, I hope it may occur to some of the many people whose fortunes rest upon the development of the engineering sciences, to do for them what the Havemeyer family have done in erecting the chemical building as a memorial of the late Frederick Christian Havemeyer.

Since our removal to the new site and up to the end of the academic year 1898–99, the membership of the University increased by at least a couple of hundred men. The year just beginning promises to add not less than two hundred more. The drawing rooms in the Engineering Departments are already becoming crowded, and the Department of Chemistry already desires the floor in Havemeyer Hall at present occupied by the Department of Architecture. The process of crowding may be carried on without disadvantage for a time, but it cannot be carried on very long. I turn with confident hope to the generous people of the city to help us quickly to meet some or all of these needs. I have by no means exhausted the catalogue of the things of which we can make good use. The purport of it all is, that Columbia University exists to serve not only this generation, but the generations to come. I earnestly hope that both old friends and new will enable it to do more and better work in the near and distant future than it has ever done before.

Respectfully,
SETH LOW,
President.

APPENDIX

VACANCIES

By Death

Henry E. McDermott, A. B.,	Assistant in Physiological Chemistry.

By Resignation

George H. Baker, A.M.,	Librarian.
Henry Winthrop Hardon, A.M., LL.B.,	Professor of Law.
Edwin B. Cragin, M.D.,	Secretary of the Faculty of Medicine.
Timothy Matlock Cheesman, M.D.,	Instructor in Bacteriology.
D. Bryson Delavan, M.D.,	Instructor in Laryngology.
Herman Stearns Davis, Ph.D.,	Tutor in Astronomy.
Charles O. Townsend, Ph.D.,	Tutor in Botany.
Thomas H. Harrington, C.E.,	Assistant in Mechanical Engineering.
Dana Clemmer Wells, A.B., E.E.,	Assistant in Physics.
Charles H. Fulton,	Assistant in Analytical Chemistry.
Henry Clapp Sherman, Ph.D.,	Assistant in Analytical Chemistry.
Wilbur Gregory Hudson, M.E.,	Assistant in Mechanical Engineering.
John Kunkel Small, Ph.D.,	Curator of the Herbarium.
George Louis Beer, A.M.,	Lecturer in Mediæval History.

By Expiration of Term

James Ewing, M.D.,	Instructor in Clinical Microscopy.
Charles Norris, M.D.,	Tutor in Pathology.
Walter R. Shaw, Ph.D.,	Tutor in Botany.
Henry Skillman Curtis, A.B.,	Assistant in Physics.
Herbert Treadwell Wade, A.B.,	Assistant in Physics.
Charles Derleth, Jr., B.S., C.E.,	Assistant in Civil Engineering.
Samuel Swayze Seward, Jr., A.M.,	Assistant in Literature.
William Robert Williams, M.D.,	Assistant in Normal Histology.
Philip Ernest Brodt, A.B.,	Assistant in Rhetoric and English Composition.

Alfred Louis Kroeber, A.B.,	Assistant in Rhetoric and English Composition.
Charles A. Harper, Ph.D.,	Assistant in Organic Chemistry.
Walter Taylor Marvin, Ph.D.,	Assistant in Philosophy.
Clarence A. McWilliams, M.D.,	Assistant in Normal Histology.
Frederic Sackett Hyde, Ph.B.,	Assistant in Analytical Chemistry.
Emil Justus Riederer, B.S.,	Assistant in Analytical Chemistry.
Allan Chotard Eustis, B.S., Ph.B.,	Assistant in Physiological Chemistry.
Edmond Kelly, A.M.,	Lecturer on Municipal Government and International Law.
Herbert Noble, A.M., LL.B.,	Lecturer on Bailments, Domestic Relations, and Insurance.
Henry Osborn Taylor, A.B., LL.B.,	Lecturer in Literature.
Charles Edward Merriam, Jr., A.M.,	Lecturer on Political Theories.
William A. Anthony, Ph.B.,	Lecturer in Electrical Engineering.
Frederic Bancroft, Ph.D.,	Lecturer on Diplomacy.
Stewart Chaplin, A.B., LL.B.,	Lecturer on Criminal Law.

PROMOTIONS

Gary N. Calkins, Ph.D.,	From Tutor in Zoölogy To Instructor in Zoölogy.
Arthur Morgan Day, A.M.,	From Assistant in Political Economy and Social Science To Instructor in Political Economy and Social Science.
Philip Hanson Hiss, Jr., Ph.D., M.D.,	From Assistant in Bacteriology To Instructor in Bacteriology.
Francis Carter Wood, M.D.,	From Assistant in Clinical Microscopy and Demonstrator in Pathology at St. Luke's Hospital To Instructor in Clinical Microscopy and Demonstrator in Pathology.
William S. Day, Ph.D.,	From Assistant in Physics To Tutor in Physics.
James Howard McGregor, B.S., A.M.,	From Assistant in Zoölogy To Tutor in Zoölogy.
Leonard Beecher McWhood, A.B.,	From Assistant in Music To Tutor in Music.
Franz Boas, Ph.D.,	From Lecturer in Physical Anthropology To Professor of Anthropology.
Edwin B. Cragin, M.D.,	From Lecturer on Obstetrics To Professor of Obstetrics.

CHANGES OF TITLES

Robert Simpson Woodward, C.E., Ph.D.,	From Professor of Mechanics To Professor of Mechanics and Mathematical Physics.
Livingston Farrand, A.B., M.D.,	From Instructor in Physiological Psychology To Instructor in Psychology.
James Ditmars Voorhees, M.D.,	From Instructor in Obstetrics and Gynecology To Instructor in Obstetrics.
Harry Alonzo Cushing, Ph.D.,	From Tutor in History To Lecturer in History.
Daniel Jordan, B.S., Pd.B.,	From Assistant in the Romance Languages and Literatures To Lecturer in the Romance Languages and Literatures.
William Zebina Ripley, Ph.D.,	From Prize Lecturer in Physical Geography and Ethnology To Prize Lecturer in Sociology.
William Robert Shepherd, Ph.D.,	From Prize Lecturer in History To Lecturer in History.
Wellington Putnam,	From Lecturer in Rhetoric and English Composition To Lecturer on Elocution.
Curtis Hidden Page, Ph.D.,	From Lecturer in the Romance Languages and Literatures To Tutor in the Romance Languages and Literatures.

APPOINTMENTS

George H. Baker, A.M.,	Librarian Emeritus.
James Hulme Canfield, LL.D.,	Librarian.
Fred J. Brockway, M.D.,	Secretary of the Faculty of Medicine.
John W. Houston,	Professor of Law.
William Ledyard Cathcart,	Adjunct Professor of Mechanical Engineering.
S. Alfred Mitchell, Ph.D.,	Tutor in Astronomy.
August Jerome Lartigau, M.D.,	Tutor in Pathology.
William B. Johnstone, C.E.,	Assistant in Physics.
Oscar Raymond Wilson, B.M.E.,	Assistant in Mechanical Engineering.
John Garrett Underhill, A.M.,	Assistant in Literature.
Joel Elias Spingarn, A.B.,	Assistant in Literature.
Lewis Nathaniel Chase, A.M.,	Assistant in Literature.
Alfred F. J. Remy, A.M.,	Assistant in Germanic Philology.
Barry Hogarty,	Assistant in Analytical Chemistry.

Frederick John Pope, Ph.D.,	Assistant in Analytical Chemistry.
Emilius W. Scherr, Jr., A.B.,	Assistant in Organic Chemistry.
Ernest Nash Wilcox, M.D.,	Assistant in Normal Histology.
Eli Long, M.D.,	Assistant in Normal Histology.
Evan M. Evans, M.D.,	Assistant in Clinical Microscopy.
William D. Cutter,	Assistant in Physiological Chemistry.
Frederick Clark Paulmier, M.S.,	Assistant in Zoölogy.
Frank Sutliff Hackett, A.B.,	Assistant in Rhetoric and English Composition.
George Balthazar Germann, Ph.D.,	Assistant in Philosophy and Education.
Augustus B. Wadsworth, M.D.,	Assistant in Bacteriology.
Philip G. Carleton, A.B.,	Assistant in Rhetoric and English Composition.
Marshall Avery Howe, Ph.D.,	Curator of the Herbarium.
Gustav Hinrichs,	Conductor of Music.
William A. Nitze, A.B.,	Lecturer in the Romance Languages and Literatures.
Harlan Fiske Stone, B.S., LL.B.,	Lecturer in the Law School.
John Archibald Fairlie, Ph.D.,	Prize Lecturer on Administration.
Henry Clapp Sherman, Ph.D.,	Lecturer in Analytical Chemistry.

RESIDENCES OF STUDENTS

	College.	Law.	Medicine.	Applied Science.	Political Science, Philosophy, and Pure Science	Total.
New York City	283	197	345	301	124	1250
Alabama		1	6	1		8
Alaska				1		1
Arkansas		1	3		1	5
California	1	4	6	2	6	19
Colorado		4	3	4	1	12
Connecticut	6	6	32	9	5	58
Delaware		1			1	2
District of Columbia		1		1	1	3
Florida		2				2
Georgia	1	1	8	1		11
Illinois	1	6	5	6	6	24
Indiana		7	3	4	3	17
Iowa		5		1	5	11
Kansas		1	2		3	6
Kentucky		5	6			11
Louisiana				1		1
Maine	1	2	5		1	9
Maryland		2		1	2	5
Massachusetts	2	9	17	3	6	37
Michigan	1		3	2	4	10
	296	255	444	338	169	1502

	College.	Law.	Medicine.	Applied Science.	Political Science, Philosophy, and Pure Science.	Total.
Brought forward	296	255	444	338	169	1502
Minnesota	1		3	1	3	8
Mississippi		1	1			2
Missouri	1	5	1	3	1	11
Montana	1	2		4	1	8
Nebraska		1	2		4	7
Nevada			2	1		3
New Hampshire	1		2		1	4
New Jersey	47	21	106	38	18	230
New Mexico		1				1
New York State*	47	32	99	46	27	251
North Carolina		1	5	1	1	8
North Dakota		2				2
Ohio	2	4	10	5	4	25
Oregon	1	1			1	3
Pennsylvania	1	10	11	8	8	38
Rhode Island		1	8	1	1	11
South Carolina					2	2
South Dakota					1	1
Tennessee	1	3	1		1	6
Texas	1	2	2	1	3	9
Utah	1	1		4		6
Vermont			2		4	6
Virginia		2	6	1	1	10
Washington		1				1
West Virginia			2			2
Wisconsin	1	1	6	1	2	11
Wyoming		1			1	2
	402	348	713	453	254	2170

FOREIGN COUNTRIES

Australia				1		1
Canada	1		6		3	10
Cuba			3	1		4
Hawaii		1	2			3
Ireland			1			1
Japan					9	9
Mexico				1		1
Persia			1			1
Russia				1	2	3
South Africa				2		2
Spain					1	1
Turkey					2	2
	403	349	726	459	271	2208

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* Exclusive of New York City.

PARENTAGE OF DEGREES

Adrian College	1
Alabama Polytechnic Institute	3
Alfred University, N. Y.	6
Allegheny College, Pa	1
Amherst College, Mass	22
Bates College, Me	3
Bellevue Hospital Medical College	1
Bethel College	1
Bowdoin College, Me	1
Brooklyn Polytechnic Institute	2
Brown University, R. I.	13
Bucknell University, Pa	3
Carlton College	1
Centre College, Ky	2
Colby University, Me	2
Colgate University, N. Y	6
College of the City of New York	104
College of Pharmacy, N. Y	14
Columbia University, N. Y	143
Cooper Institute	1
Cornell College, Ia	1
Cornell University, N. Y	13
Crozer Theological Seminary	1
Curry University	1
Dartmouth College, N. H	4
Davidson College, N. C	1
Delaware College	1
De Pauw University, Ind	2
Dickinson College, Pa	1
Emory College, Ga	1
Eureka College, Ill	3
Fordham College, N. Y	1
Franklin College	1
General Theological Seminary, N. Y	2
Georgetown University, D. C	2
Grove City College, Pa	1
Guilford College	1
Hamilton College, N. Y	4
Hamline University	1

Hanover College, Ind	2
Harvard University, Mass	71
Haverford College, Pa	1
Hobart College, N. Y	9
Holy Cross College, Mass	2
Illinois College	1
Indiana University	6
Iowa Wesleyan University	1
Jefferson Medical College, Pa	1
Johns Hopkins University, Md	7
Knox College, Ill	2
Lafayette College, Pa	5
Lake Forest University, Ill	1
Lehigh University, Pa	1
Leland Stanford Junior University, Cal	21
Lenox College, Ia	1
McMinnville College, Ore	1
Manhattan College, N. Y	7
Marietta College, O	2
Maryland Agricultural College	1
Memphis Law School, Tenn	1
Millsop College, Miss	1
Missouri Medical College	1
Montana School of Mines	2
Mt. Pleasant University, Ia	1
Mt. St. Mary's College, Md	1
National College of E. T., Lima, O	1
National University, D. C	1
New Hampshire College of Agriculture	1
New York Law School	2
New York University	22
Northwestern University College of Pharmacy	1
Notre Dame University, Ind	2
Oberlin College, O	5
Ohio State University	1
Ohio Wesleyan University	3
Penn College, Ia	2
Pennsylvania Military College	1
Pennsylvania State College	1
Princeton University, N. J	41

Rensselaer Polytechnic Institute, N. Y.	1
Ripon College, Wis.	1
Roanoke College, Va.	4
Rose Polytechnic Institute, Ia.	1
Rutgers College, N. J.	9
St. Francis Xavier College, D. C.	2
St. Francis Xavier College, N. Y.	26
St. John's College, Brooklyn, N. Y.	1
St. John's College, Md.	1
St. Johns College, New York	2
St. Joseph's University	1
St. Lawrence University, N. Y.	1
St. Louis Medical School	1
St. Stephen's College, N. Y.	1
Seton Hall College, N. J.	3
South Dakota Agricultural College	2
Southwestern University, Tex.	1
State University of Iowa	5
Storr's Agricultural College	1
Swarthmore College, Pa.	2
Syracuse University, N. Y.	4
Trinity College, Conn.	14
Trinity University, Tex.	1
Union College, N. Y.	2
Union Theological Seminary, N. Y.	2
University of Alabama	2
University of Buffalo	1
University of California	6
University of Cincinnati	1
University of Colorado	1
University of Denver	1
University of Georgia	2
University of Kansas	3
University of Kentucky	1
University of Louisville, Ky.	4
University of Michigan	9
University of Minnesota	7
University of Missouri	1
University of Nebraska	5
University of Nevada	3

University of North Carolina	1	
University of North Dakota	1	
University of Ohio	1	
University of Pennsylvania	1	
University of Rochester, N. Y	3	
University of Tennessee	1	
University of Texas	4	
University of Vermont	4	
University of Virginia	3	
University of Wisconsin	6	
U. S. Naval Academy	2	
Vanderbilt University, Tenn	3	
Wabash College, Ind	6	
Wesleyan University, Conn	12	
Western Reserve University	2	
Westminster College	1	
Williams College, Mass	27	
Wofford College, S. C	1	
Wooster University, O	3	
Worcester Polytechnic Institute, Mass	1	
Yale University, Conn	83	
		908

Foreign Institutions :

Barcelona University, Spain	1	
Cambridge University, England	1	
Gymnase Coutanah de Neuchatel, Switzerland	1	
Gymnasium, Jena, Germany	1	
McGill University, Canada	3	
Munich Polytechnic High School, Germany	1	
Oroomiah College, Persia	1	
Queens University, Canada	1	
Real Schule Gratz, Austria	1	
University of Halle, Germany	1	
University of Havana, Cuba	3	
University of Leipzig, Germany	1	
University of New Brunswick, Canada	2	
University of Ontario, Canada	2	
University of Oxford, England	2	
University of Toronto, Canada	1	
		23

Institutions		Degrees	931
American	140	Students holding more than one degree	130
Foreign	16		
Total	156	Total students holding degrees	801

LECTURES

The following public lectures were delivered under the auspices of the University, during the academic year 1898–99:

AT THE UNIVERSITY

In 305 Schermerhorn :

October	19.	The Life and Services to this Country of Marquis Lafayette. J. H. Robinson.
“	24.	A Description of the Work done by Nathan R. Harrington and Reid Hunt on their Zoölogical Expedition to the Nile, 1898. Nathan R. Harrington.

Under the auspices of the Department of the Romance Languages and Literatures :

November	3.	La France et l'Angleterre en Afrique. Adolphe Cohn.
“	10.	Les Marins de la France. Adolphe Cohn.
“	17.	La Liberté Religieuse en France. Adolphe Cohn.
December	1.	La Sphère d'Action du Gouvernement en France. Adolphe Cohn.
“	8.	La Morale de Zola. Henry Bargy.
“	15.	L'Opéra Comique en France. Adolphe Cohn.
“	22.	L'Année 1898 en France. Adolphe Cohn.
January	5.	L'Académie Française en 1899. Adolphe Cohn.
“	12.	L'Exposition Universelle de 1900. B. D. Woodward, Assistant Commissioner General of the U. S. to the Paris Exposition.

January 19. Les Noms des Rues à Paris. Adolphe Cohn.
" 26. Rouget de Lisle et la Marseillaise. Daniel Jordan.
February 16. Savinien de Cyrano Bergerac. C. H. Page.
" 23. Adolphe Dennery et le Mélodrame en France. Adolphe Cohn.
March 2. La Présidence de Félix Faure. Adolphe Cohn.
" 9. Les Suisses dans la Littérature Française. Adolphe Cohn.
" 16. La Philosophie Française de Descartes à Guyau. Adolphe Cohn.
" 23. Erckmann - Chatrian et le Roman National. Adolphe Cohn.
April 6. La Science et la Liberté. Raoul Pictet.
" 13. La Ville Éternelle. Adolphe Cohn.
" 20. Le Monde en Quarante-cinq Minutes. Edmond Bruwaert, Consul General of France.
" 27. Le Drame Français du Cid à Cyrano de Bergerac. Adolphe Cohn.

THE FOUNDATIONS OF ZOÖLOGY

William Keith Brooks
of Johns Hopkins University

December 5. Introduction.
" 6. Huxley : and the Naturalist.
" 7. Nature and Nurture.
" 8. Lamarck.
" 9. Migration and Lamarckianism.
" 12. The Philosophy of Evolution.
" 13. Galton and Inheritance.
" 14. Darwin, and the Origin of Species.
" 15. The Mechanism of Nature.
" 16. Louis Agassiz and George Berkeley.

HOLLAND SOCIETY LECTURES ON DUTCH LITERATURE

Leonard Charles Van Noppen, A.M.

January 4. Early Dutch Literature.
" 11. The Augustan Age of Holland.

January 18. Vondel, the Man and Poet.
" 25. Vondel's "Lucifer."
February 1. From Antonides to the School of Heiloo.
" 8. The Dutch Poets of To-day.

HYDE LECTURES ON LIFE INSURANCE

Charlton T. Lewis

February 27. General Introduction. The nature of Insurance and the beginnings and historic growth of Life Insurance.
" 28. The scientific study of Probabilities as the basis of Life Insurance.
March 6. The method and value of Statistics.
" 7. The evolution of Tables of Mortality.
" 13. Interest on Capital, its nature, history, determining causes, and fluctuations.
" 14. The valuation of life contingencies, Annuities, and Assurances.
" 20. Annual Premiums, Term Insurance, Endowments, and complex forms of Insurance associated with investments.
" 21. The nature of reserves in Life Insurance, the computation of them and their functions.
" 27. The expenses of Life Insurance Companies, the loading of premiums, office or gross premiums.
" 28. The sources of surplus in Life Insurance, and the distribution of it in Mutual Companies.
April 3. The termination of the Life Insurance Contract, by maturity, expiration, lapse, or surrender.
" 4. Selection for or against the company, as an influence disturbing anticipated averages in Life Insurance.
" 10. Gambling and fraud in Life Insurance.
" 11. Relations of Life Insurance Companies and their business to the State, government supervision of Life Insurance.
" 12. Extensions of Insurance principle, Life Insurance as a social institution.

March 8. The Activity of the State in Australia and New Zealand. Henry de R. Walker.

VICTOR HUGO

Curtis Hidden Page

April 5. Victor Hugo and the Romantic Movement in France, to 1830.
" 12. Victor Hugo, dramatist and poet.
" 19. Victor Hugo, poet and novelist.
" 26. Victor Hugo the man; Victor Hugo and French ideals in the 19th century.

In 309 Havemeyer:

Albert Venn Dicey
Vinerian Professor of English Law in Oxford University

December 5. The Character and Career of George III.
" 7. The Development of English Law during the present century, in connection with the course of public opinion.
" 8. The Work and Inventions of Hiram S. Maxim. Hiram S. Maxim of London.

Professor Cunningham
of Cambridge University, England

January 12. The Development of English Towns.
" 13. The Organization of the Building Trades.

Under the auspices of the Department of the Germanic Languages and Literatures:

February 7. Rev. Gustav Gottheil, Ph.D., Rabbi of Temple Emanu-el: Goethe's "Epilog zu Schillers Glocke."
" 14. Julius F. von Vesteneck, J.U.D.: Das Leben in den Alpen. Eine Cultur-historische Skizze.
" 21. Rudolf Tombo, Ph.D., Columbia University: Volks Etymologie.
" 28. Rev. August Ulmann, S.T.D., Rector of Trinity School: Die Entwickelung des religiösen Denkens und Lebens in Deutschland.

March 7. Henry E. Krehbiel: Das Volkslied in Amerika. Mit musikalischer Begleitung.
" 14. Louis Viereck, late member of the German Reichstag: Eine Reise nach Alaska. Illustrirt.
" 21. Heinrich Conried, Manager of the Irving Place Theatre: Die Kunst des Sprechens.
" 28. Rudolf Tombo, Ph.D., Columbia University: Walther von der Vogelweide.

Under the auspices of the Department of Chemistry:

March 9. Electro-Chemistry. Charles F. Chandler, Ph.D.
" 16. Electric Furnaces. Samuel Auchmuty Tucker, Ph.D.
" 23. The Influence of Low Temperature on Chemical Action. Raoul Pictet.
" 29. Assaying of Gold and Silver and Mint Methods. Pierre de Peyster Ricketts, E.M., Ph.D.
April 3. Carbonic Oxide and Carbonyl. Victor Lenher, Ph.D.
" 10. Calico Printing with Azo-colors. Charles E. Pellew, E.M.
March 22. What can be Done for the Drama. Mr. William Archer.

JEAN JACQUES ROUSSEAU

Edouard Rod

March 25. Origines et Premières Années de Jean Jacques Rousseau.
" 27. Ses Idées.
" 30. Son Roman.
April 1. Ses Dernières Années.

THE PRINCIPLES OF ÆSTHETICS AS ILLUSTRATED BY GREEK ART

Charles Waldstein, Ph.D., Litt.D., L.H.D.
of Cambridge University, England

April 5. Principles of Æsthetics.

April 7. Early Artistic Effort in Ancient Greece.
" 12. The Realization of Art in Greek Sculpture.
" 14. The Decline of Greek Art.

In 506 Fayerweather:

Under the auspices of the Department of Indo-Iranian Languages:

March 3. Temples of India. Washburn Hopkins, Professor of Sanskrit and Comparative Philology in Yale University.
" 17. The Yajur and the Atharva Veda, or the Rites and Popular Beliefs of Ancient India. A. V. Williams Jackson.
" 29. Education in India. W. I. Chamberlain, M.A., Fellow of the Madras University.

AT THE AMERICAN MUSEUM OF NATURAL HISTORY

RADIANT ENERGY

William Hallock
of Columbia University

December 3. Wave Motion.
" 10. Visible Radiant Energy.
" 17. Radiant Heat.
" 31. Electrical Radiation.

THE GREAT LAKES

R. S. Woodward,
of Columbia University

January 7. The Geography and Geology of the Great Lakes.
" 14. The Geodesy and Hydrography of the Great Lakes.
" 21. The Climatology and Commerce of the Great Lakes.
" 28. Boiling and Freezing. M. I. Pupin of Columbia University.

MINERALOGY

February 4. The Transmission of Light in Crystals. Alfred J. Moses of Columbia University.

" 11. The Characters of Minerals in Rock Sections. Lea McI. Luquer of Columbia University.

" 18. The Methods Employed in the Investigation of Minerals, especially their Application to the Identification of Species. S. L. Penfield of Yale University.

" 25. Testing Minerals. Alfred J. Moses of Columbia University.

ECONOMIC GEOLOGY

March 4. The Newer Gold Regions of the West: Cripple Creek, Col.; Mercur, Utah; The Black Hills, S. Dak.; The Yukon Basin. J. F. Kemp of Columbia University.

" 11. Gold and Silver Mines of Montana. Walter H. Weed of the United States Geological Survey.

" 18. Clay and its Uses. Heinrich Ries of the Geological Department, Cornell University.

" 25. The Geology of Petroleum. David T. Day of the United States Geological Survey.

AT THE METROPOLITAN MUSEUM OF ART

SOME CITIES OF NORTHERN ITALY DURING THE 15TH AND 16TH CENTURIES

D. Cady Eaton

December 3. The plains of Lombardy. The Este family (1208–1597), Ferrara; The Castle, Parisina and Hugo; The Cathedral, Hercules II and Réné of France. Cathedral of Modena, Sculpture of Nicolaus and Wiligelmus (1099). Guido Mazzoni (–1518) and Antonio Beggarelli (1470–1565): Their works in Modena, Ferrara, etc.

December 10. Borso d'Esté first duke of Ferrara and Modena (1413–1471). Frescos in the Schifanoja. Beatrice d'Esté (1475–1497). The Louvre bust. Her marriage to Ludovico il Moro (1451–1508). Charles VIII and Louis XII of France in Italy. Death of Beatrice. Imprisonment and death of Ludovico. Their tomb in the Certosa of Pavia.

‘ 17. Mantua. Its situation. The Gonzagas (1329–1706). San Andrea. The Cathedral. The Corte Reale. The Castello di Corte. Mantegna (1431–1506); His frescos in the Camera degli Sposi of Ludovico Gonzaga (1414–1478) and his family.

" 24. Gian Francesco Gonzaga (1466–1519) and Isabella d'Esté (1474–1539). How they looked Her Studiolo in the Castello di Corte. Pictures in the Studiolo by Mantegna, Perugino, and Lorenzo Costa. The battle of Fornovo. The Madonna della Vittoria.

" 31. Isabella and her son Frederico (1500–1540) first Duke of Mantua; Giulio Romano (1492–1546) in Mantua from 1524 until 1540. His frescos in the Sala di Troja. The Palazzo del "T." Frescos in the Camere dei Cavalli, di Psiche, and dei Giganti. Siege and sacking of Mantua in 1630. Last dukes of Mantua. End of the duchy after the defeat of the French by Prince Eugène before Turin in 1706.

JAPANESE ARCHITECTURE AND PAINTING

W. B. Van Ingen

January 7. The Japanese People and their Architecture.
" 14. The Temples at Nikko.
" 21. The History of Japanese Painting.
" 28. Hokŭsai and the Modern School of Painters.

MOHAMMEDAN ARCHITECTURE

William R. Ware
of Columbia University

February 4. Egypt. The Copts. Geometrical Forms.
" 11. Spain. The Moors. Stalactites.
" 18. Constantinople. The Turks. Tiles and Glass.
" 25. Persia and India. Domes.

March 4. Lessons from Japanese Art. John La Farge.
" 11. Tendencies in Modern Painting. William A. Coffin.
" 18. Velasquez and the Influence of his Work upon the Art of our Time. William M. Chase.
" 25. On Two Venetian Masters. Edwin Howland Blashfield.

AT COOPER UNION

SHAKESPEARE AND SOME OF HIS PRINCIPAL DRAMAS

Henry A. Clapp

December 6. Shakespeare, as Man and Poet.
" 13. The First Part of Henry IV.
" 20. Othello.
" 27. Hamlet.

LETTERS AND MANNERS

James E. Learned

January 3. American Humor, I.—Characteristics and Examples—Wit and Humor; the Distinction not Vain—Sources of American Humor—Its Teaching Power—Rural Humorists—The "New England School," Old and New.
" 10. American Humor, II.—The Southern and Western School—Judge Longstreet and his Successors—Sol Smith's Recollections—Pictures of a Vanished Life—John Phoenix—Artemas Ward and his Contemporaries—American Humor not yet Dying out.

January 17. Don Quixote, I.—Lasting Fame of the Book—Its Repute still Growing—The Author's Self-Revelation—Sketch of Cervantes—Beauty of his Character—The Aim of his Work—Romances of Chivalry—Modern Knight-Errantry.

" 24. Don Quixote, II.—Summary of the Story—The Style—Scriptural Allusions—Parallels with Other Writers—The Question of Coarseness—Character of the Don—Sancho Panza—Inward and Outward Truth—English Translations.

" 31. City and Country Living—Elements of a Broad Enquiry—" The Freedom of the City "—A Universal Appeal — Rural Civilization — Social Equality—Wide Diffusion of " Faculty "—Some Characteristic Failures—Roads and Forests—Morals and Speech.

WITH THE SPANISH CONQUISTADORES IN ARIZONA AND NEW MEXICO

G. Wharton James
of Pasadena, California

February 7. The Discovery of the Seven Cities of Cibola. (With upwards of 75 illustrations of the Zuni of to-day.)

" 14. The Discovery of the Province of Tusayan and the Seven Cities of the Moki. (Upwards of 100 illustrations of modern Moki with a full account of the Snake Dance.)

" 21. The Discovery of the Grand Canyon of the Colorado. (Illustrated with 100 photographs of all the known trails into the Grand Canyon.)

" 28. Acoma and the Enchanted Mesa. (Illustrated with upwards of 100 photographs of Acoma, the Enchanted Mesa, the Acomas and their Sun-Dance.)

LIFE AS INTERPRETED BY THE POETS

Charles Sprague Smith

March 7. "The Prometheus Bound," Æschylus.
" 14. "Hamlet," Shakespeare.
" 21. "Life is a Dream," Calderon.
" 28. "Faust," Goethe.

MISCELLANEOUS GIFTS RECEIVED DURING ACADEMIC YEAR 1898–99

(Gifts in money stated in the Treasurer's Report, and gifts to the Library stated in the Librarian's Report are omitted.)

DEPARTMENT OF CHEMISTRY

Waldron Shapleigh, Welsbach Incandescent Lamp Co.,
Set of specimens illustrating Welsbach's separation of didymium salts into salts of neodymium and praseodymium.
Specimens of neodymium ammonium nitrate; praseodymium; ammonium nitrate; neodymium oxalate; praseodymium oxalate; lanthanum oxalate; cerium oxalate; cero ammonium nitrate; ceric ammonium nitrate; yttrium erbium nitrate; monozite from Brazil; monozite from North Carolina; zircon from North Carolina.

E. G. Acheson, Carborundum Works, Niagara Falls, N. Y.,
Collection of forty-two carborundum specimens.
Specimen of artificial graphite.

Wilson Carbide Works, St. Catherine, Canada,
Electrode used in making calcium carbide.

Elwyn Waller,
Ancient candle moulds.

Edward Gudemann, Chicago, Ill.,
Specimens of black and white india-rubber substitutes.

Fries Bros., New York,
Complete set of their synthetic drugs and perfumes.

John A. Meyers, New York,
Samples illustrating the nitrate industry in Chili.

Southern Cotton Oil Co., Savannah, Ga.,
Complete set of samples illustrating the cottonseed oil industry.

Mergentime & Lamm, New York,
Samples of medicinal and flavoring extracts and the raw products from which prepared.

Leo Baekeland, Nepara Chemical Co., Nepara Park, N. Y.,
Set of framed photographic prints upon "velox" paper.

A. E. Knorr, Guggenheim Smelting Co., Perth Amboy, N. J.,
One Knorr extraction apparatus, complete.

Stewart F. Carter, Windsor Print Works, North Adams, Mass.,
Ten yards of calico padded with Beta napthol.

Clayton Aniline Co., Manchester, England,
Fifteen samples of artificial dyestuffs and a set of sample books.

Pickhard & Kutroff, New York,
Two gallons alizarine assistant.

F. Bayer & Co., New York,
Collection of sample books as published.

Victor Koechl & Co., New York,
One pound paranitraniline; one sample of asophore blue; one sample of asophore red; one sample book of the developed colors.

Matheson & Co., New York,
Collection of sample books as published.

Charles E. Pellew,
Salary of a librarian for the Chemical Library in Havemeyer Hall for twelve weeks, $96.

P. de P. Ricketts,
Wages of a boy for the Quantitative Chemical Laboratory, $121.60.

C. F. Chandler,
Apparatus and chemicals for the chemical laboratories, $851.95.

DEPARTMENT OF CIVIL ENGINEERING

For the Road-making Material Testing Laboratory,
Jefferson Seligman, $100; Joseph J. O'Donohue, Jr., $50; Nathan Straus, $50; Fred Dietz, $50; Calvin Tomkins, $50; O. L. Jones, $100; Isaac N. Seligman, $100.

DEPARTMENT OF MECHANICAL ENGINEERING

For the installation and fitting up of the locomotive "Columbia,"
George V. Cresson, Philadelphia, Pa.
The Carnegie Steel Co., Pittsburgh, Pa.
Charles H. Davis, President of the John Stephenson Co., New York.
The Joseph Dixon Crucible Co.
The Mechanical Manufacturing Co., Chicago, Ill.
The Pennsylvania Steel Co., Steelton, Pa.
New York Central & Hudson River Railroad Co.

Francis H. Stillman.
Alfred Liebmann.
Ernest Miller, Cleveland City Forge and Iron Co.

The American Impulse Wheel Co., New York,
One American Impulse Water Wheel for the Hydraulic Motors Laboratory.

General Electric Co., Schenectady, N. Y.,
One electric street car motor outfit, to be attached to the trolley car presented by the J. G. Brill Co.

H. G. Hammett, Troy, N. Y.,
One Richardson-Allen locomotive slide valve.

Edward L. Coster,
Framed large-size photographs of locomotives and railway rolling stock.

Walter L. Cheney, Meriden Tool Co.,
Board containing mounted samples of the work manufactured by the tools of Mr. Cheney's design.

Rudolph Conrader,
Invention for the filtration of machinery oil which has been used in excess upon bearings, and which, if purified, can be used again.

Thomas F. Rowland, Continental Iron Works, and Adolph Bender, De La Vergne Refrigerating Co.,
Three massive plates for use in the Laboratory, whereby machinery and apparatus can be secured in position, tested, and removed at the conclusion of testing.

Warner & Swasey, Cleveland, Ohio,
Machine which is known as a No. 2 Screw Machine, with tools.

DEPARTMENT OF GEOLOGY

H. C. Rizer, United States Geological Survey,
A number of geological maps.

James F. Kemp,
Six glass cases for the Museum of Economic Geology ; a collection of rocks and fossils from Paleozoic formations of James River Valley, near Clifton Forge, Va. ; expenses of Mining Department, repairs to microscopes, etc., $68.86.

George F. Kunz,
Fourteen specimens of meteorites and meteorite minerals.

E. H. Barbour,
A collection of rocks and fossils from Nebraska, Wyoming, and the Dakotas.

V. B. Buck,
A collection of fossils from Georgian Bay, Ontario, Canada.

A. P. Colman,
  A collection of wood and leaves from the Interglacial clays near Toronto, Canada.

B. F. Hill,
  A collection of rocks and fossil plants from Mexico.

G. B. Rosenblatt,
  A collection of Hamilton group fossils from Canandaigua Lake, N. Y.

Gilbert van Ingen,
  A collection of Niagara fossils and rocks from Adams Basin, Rochester, and Niagara Falls, N. Y.; of crabs from the Cretaceous clay marls at Cliffwood, N. J.; also cash towards running expenses of Department, $18.53.

Charles Willgeroth,
  Specimens of Cambrian trilobites from Mt. Stephen, British Columbia.

S. S. Fowler,
  A collection of rocks and ores from British Columbia.

David T. Day,
  Collections of ores from Colorado, Montana, South Dakota. Three large cases.

L. H. Barnett,
  Box of ores from Rico, Colo.

Heinrich Ries,
  Two boxes of clay and ores.

John Duer Irving,
  A collection of rocks from the Black Hills of South Dakota.

George W. Maynard,
  A collection of rocks and fossils.

W. B. Newberry,
  An intaglio of the late Prof. J. S. Newberry.

W. C. Broegger,
  A collection of rocks from the vicinity of Kristiania, Norway.

A. A. Anderson,
  A collection of rocks from Western Wyoming.

DEPARTMENT OF MINERALOGY

F. Augustus Schermerhorn,
  Colt Criterion Lantern with accessories.

August Raht,
  Specimen of Marshite.

Walter B. Devereux,
  Gold and copper minerals from Colorado.

Charles H. Senff,
Goldschmidt two-circle goniometer.

William Fellowes Morgan,
Collection of Brazilian minerals.

DEPARTMENT OF PATHOLOGY

William H. Draper,
Current volumes of Schmidt's Jahrbücher der in- und Ausländischen Gesammten Medicin.

Gustav Langmann,
Volumes 1–25: Deutsche vierteljahrsschrift für öffentliche Gesundheitspflege.

Francis H. Markoe,
Volumes 23–48: Revue des Sciences Medicales; Volumes 1–19: Centralblatt fur klinische Medicin; Volumes 1–11: Medizinische Bibliographie.

James W. McLane,
Volumes of the "Lancet" 1823–29, 1870–81; 4 volumes Rokitanski's "Pathological Anatomy"; 1 volume Wild's "Pathological Anatomy"; 1 volume Hasse's "Pathological Anatomy"; 2 volumes Gross' "Pathological Anatomy."

Max Levy,
Two half-tone process-screens ruled on glass.

DEPARTMENT OF PHYSICS

J. S. Ames of the Johns Hopkins University,
25 glass positives of photographs of grating spectra taken with the large spectrograph at Johns Hopkins University.

DEPARTMENT OF ZOÖLOGY

Mrs. H. D. Van Nostrand,
Collection of shells.

Henry F. Osborn,
$200 (1898) $200 (1899) towards the Senff Zoölogical Expedition; also pamphlets relating to invertebrate zoölogy and a series of memoirs.

GYMNASIUM

A. G. Spaulding & Bros.,
86 pamphlets relating to athletic games and sports.

Adna G. Bowen,
Spirometer.

LECTURES

Edwin R. A. Seligman and Friends,
  $100 to cover cost of two lectures by Prof. Cunningham.
James H. Hyde,
  Provision for a course of fifteen lectures on Life Insurance delivered by Charlton T. Lewis.
Oswald Ottendorfer,
  $1000 to cover cost of a course of German lectures.
Holland Society,
  $300 to cover cost of a course of lectures on Dutch literature.
Friends of the University through Brander Matthews,
  $50 to cover cost of lecture delivered by William Archer.
James H. Hyde, Mrs. Esther Herrman, The French Chamber of Commerce, Robert J. Hoguet, Frederic R. Coudert, and Seth Low,
  Subscriptions amounting to $500 for a course of lectures delivered by M. Edouard Rod.

MISCELLANEOUS

Cornelius N. Bliss,
  Map of the United States published under the direction of the Commissioner of the General Land Office.
J. Ackerman Coles,
  Bust of Cicero.
Thomas Egleston,
  His collection of books and minerals, made during his lifetime.
Seth Low,
  Portrait of his father, Abiel Abbot Low.

COLUMBIA COLLEGE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York.

SIR:

I beg to submit herewith my report upon the College for the academic year ending June 30, 1899.

The number of students matriculated at the beginning of the year was 407; 7 entered subsequently, making the total number 414, distributed in the several classes as follows:

Seniors	53
Juniors	87
Sophomores	89
Freshmen	136
University students taking one or more courses in the College	11
Special students	38
	414

The ages of the students at the beginning of the year were as in the following table:

AGES OF STUDENTS

Class.	Number in Class.	Average Age.	Oldest.	Youngest.
Senior	53	20.6	25	18
Junior	87	18.9	29	17
Sophomore	89	19.6	47	16
Freshmen	136	18.1	22	15
University students	11	21.8	26	18
Special students,	38	20.6	33	16
	414	19.9	47	15

Number in each class of the following ages:

	Seniors.	Juniors.	Sophomores.	Freshmen.	University Students.	Specials.
Between 15 and 16	..	..	..	8	..	..
“ 16 and 17	..	..	3	23	..	2
“ 17 and 18	..	3	10	26	..	6
“ 18 and 19	5	13	29	45	1	5
“ 19 and 20	10	29	22	18	..	7
“ 20 and 21	17	22	11	11	3	5
“ 21 and 22	11	12	7	3	1	8
“ 22 and 23	6	5	2	2	2	..
“ 23 and 24	2	2	3	..	1	1
“ 24 and 25	1	..	..	..	2	1
“ 25 and 26	1	..	1	..	..	1
“ 26 and 27	..	..	..	..	1	..
“ 28 and 29	..	..	..	..	..	1
“ 29 and 30	..	1	..	..	..	..
“ 33 and 34	..	..	..	..	..	1
“ 47 and 48	..	..	1	..	..	..

The residences of the students were as follows:

California	3
Connecticut	6
Georgia	1
Illinois	1
Maine	1
Massachusetts	2
Michigan	1
Minnesota	1
Missouri	1
Montana	1
New Brunswick, Canada	1
New Hampshire	1
New Jersey	47
New York City	286
New York State *	52
Ohio	2
Oregon	1
Pennsylvania	1
Tennessee	1
Texas	2
Utah	1
Wisconsin	1
	414

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* Exclusive of the city of New York.

Of the students admitted, twenty-two were received on certificate from other colleges; five to the Freshman class: two from the College of the City of New York, and one each from St. Stephen's College, New York University, and Minnesota University; seven to the Sophomore class from the following institutions: two from the College of the City of New York, two from Yale College, and one each from Tennessee University, Trinity College, and Colgate University; eight to the Junior class from the following institutions: one each from the College of the City of New York, St. Stephen's College, St. John's College, Princeton College, Oberlin College, Yale College, Charleston City College, and Dickinson College; one to the Senior class from Princeton College, and one as a special student from the University of Pennsylvania.

Of the members of the Freshman class, seventy-seven were admitted provisionally—that is, with entrance conditions to fulfil. Such students are held under probation till the end of the first half-year. Just prior to the close of the probationary period, the Dean considers the special reports made by heads of departments in the case of each conditioned student, and determines whether he is to be admitted to full standing, have his period of probation extended, or be dropped from the roll.

Under this provision, sixteen were advanced to full standing at the end of the first term; the others had their period of probation extended until the beginning of the next academic year. Five members of the Freshman class, seven of the Sophomore class, three members of the Junior class, one member of the Senior class, and eight special students retired from the College during the year.

Forty-nine members of the Senior class, two "belated" Seniors, and one special student, fifty-two in all, satisfied all the requirements for the baccalaureate degree and had conferred upon them, at the Commencement held on the 7th instant, the degree of Bachelor of Arts.

Three members of the Senior class failed to satisfy the requirements for a degree and were not graduated.

The relations of this College to Barnard College are such that Columbia is responsible for the efficiency and sufficiency of all the courses in that College leading to a degree, and on proper certification grants to students thereof the degree of Bachelor of Arts. It was my duty, therefore, as Dean of this College, to examine with care the courses pursued by the members of the Senior class of Barnard College from the beginning to the end of their academic career. This duty I discharged, and certified to the President that twenty-one members of that class had complied with all the requirements for the baccalaureate degree—and those so certified received that degree at Commencement.

The subjects of study selected by the special students were:

Anthropology	1	Latin	4
Botany	2	Literature	5
Chemistry	8	Mathematics	6
Economics	11	Philosophy	6
Education	1	Physics	6
English	19	Psychology	1
French	23	Rhetoric	33
German	9	Sociology	1
Greek	3	Spanish	2
History	27	Zoölogy	1

Of the eighty-seven members of the Junior class, two were "belated" Seniors,—that is to say, were required to matriculate as Juniors because of deficiency in some requirements of that class; of the eighty-nine members of the Sophomore class, five were, in the same sense, "belated" Juniors; and of the one hundred and thirty-six members of the Freshman class, ten were, in the same sense, "belated" Sophomores.

Students are classified in three groups, according to the topics presented by them for entrance.

Candidates for admission to the Freshman class must pass satisfactory examination in English, elementary mathematics, and Latin, and also in one of the following groups of subjects:

I	Greek French	II	Greek German	III	A natural science with laboratory work (chemistry, physics, or botany), and three of the following subjects: French, German, History, Advanced Mathematics.

The required number of hours of attendance a week for all groups, excluding those who are repeating, in the Freshman class is fifteen. Of the new members of that class, 51 entered in Group I, 51 in Group II, and 24 in Group III. Freshmen in Groups I and II are required to take twelve hours of prescribed studies and one elective course of three hours. In Group I the prescribed studies are Greek or Latin, elementary German, mathematics, and rhetoric; the elective courses, of which one must be taken, are chemistry, English, French, Latin, Greek, physics, and history. The choice of electives made by the 51 students in Group I was numerically as follows:

Chemistry	10
English	7
French	19
German	2
Greek	11
History	1
Latin	1
Physics	8

In Group II the prescribed studies are the same as those in Group I, with the substitution of elementary French for elementary German; and the elective courses are the same, with the substitution of German for French. The choice of electives made by the 51 students in Group II was numerically as follows:

Chemistry	6
English	10
German	18
Greek	19
History	1
Latin	2
Physics	8

Of the 102 Freshmen in Groups I and II, thirty-four continued the study of both Greek and Latin during the year.

Freshmen in Group III are required to take six hours of prescribed studies and three elective courses of three hours each. The prescribed studies are Latin and rhetoric; the elective courses, of which three must be taken, are chemistry, physics, mathematics, mechanical engineering, English, French, German, and elementary Greek. The choice of electives made by the twenty-four students in Group III was numerically as follows:

Chemistry	5
English	5
French	22
German	12
Greek	2
History	7
Mathematics	11
Mechanical Engineering	1
Physics	11

The required number of hours of attendance a week for the Sophomore class is sixteen. Students in Groups I and II have seven hours of prescribed studies and nine hours of elective; the prescribed studies are history, rhetoric, and a course in botany, chemistry, physics, or zoölogy. Of the 89 members of the Sophomore class, 14 were in Group III, and the remainder in Groups I and II; of the 75 in Groups I and II, 12 of the students were not required to elect a course in natural science in the Sophomore year; of the remaining 63, 17 took chemistry, 41 took physics, and 5 took botany; in addition to this the following elections were made:

Astronomy (1 course elected)		1
Botany (1 course elected)		4
Chemistry (3 courses elected)		7
English (4 courses elected)	62	
Deduct for repetition	6	56
French (4 courses elected)		43
Geology (1 course elected)		1

German (7 courses elected)		32
Greek (5 courses elected)	25	
Deduct for repetition	2	23
History (3 courses elected)		5
Italian (1 course elected)		3
Latin (8 courses elected)	45	
Deduct for repetition	4	41
Literature (1 course elected)		1
Mathematics (3 courses elected)		12
Mechanical Engineering (1 course elected)		5
Music (3 courses elected)		4
Philosophy (2 courses elected)		23
Physics (1 course elected)		8
Political Economy (1 course elected)		5
Rhetoric (3 courses elected)	19	
Deduct for repetition	4	15
Spanish (1 course elected)		5
Zoölogy (1 course elected)		1

Sophomores in Group III have four hours of prescribed study in history and rhetoric, and twelve hours of elective courses; by the fourteen students in this Group the following elections were made:

Botany (1 course elected)		2
Chemistry (1 course elected)		3
English (3 courses elected)	14	
Deduct for repetition	2	12
French (4 courses elected)		7
German (6 courses elected)	10	
Deduct for repetition	1	9
Greek (1 course elected)		1
Italian (1 course elected)		1
Latin (3 courses elected)		5
Mechanical Engineering (1 course elected)		2
Philosophy (2 courses elected)		6
Physics (2 courses elected)		6
Political Economy (1 course elected)		1
Psychology (1 course elected)		1
Rhetoric (2 courses elected)		2
Spanish (1 course elected)		3
Zoölogy (1 course elected)		1

Of the fifteen hours a week required of the Junior class three hours are given to prescribed studies in philosophy and political economy. The remaining twelve hours are given to elective courses.

The following table indicates numerically the elections made among the courses open to Juniors:

Anthropology (1 course elected)		1
Architecture (1 course elected)		1
Astronomy (1 course elected)		2
Botany (4 courses elected)	7	
Deduct for repetition	1	6
Chemistry (4 courses elected)	23	
Deduct for repetition	1	22
Economics (3 courses elected)	10	
Deduct for repetition	1	9
Education (1 course elected)		2
English (8 courses elected)	88	
Deduct for repetition	26	62
French (8 courses elected)	18	
Deduct for repetition	3	15
Geology (1 course elected)		6
German (9 courses elected)		20
Greek (4 courses elected)		19
History (9 courses elected)	65	
Deduct for repetition	15	50
Indo-Iranian (1 course elected)		1
Italian (1 course elected)		1
Latin (7 courses elected)	25	
Deduct for repetition	2	23
Literature (2 courses elected)	19	
Deduct for repetition	1	18
Mathematics (4 courses elected)	14	
Deduct for repetition	3	11
Mechanics (1 course elected)		4
Mechanical Engineering (3 courses elected)	6	
Deduct for repetition	1	5
Mineralogy (1 course elected)		1
Philosophy (2 courses elected)		11
Physics (2 courses elected)		12
Psychology (1 course elected)		11

Rhetoric (4 courses elected)	51	
Deduct for repetition	13	38
Semitic (4 courses elected)	4	
Deduct for repetition	1	3
Spanish (1 course elected)		9
Zoölogy (3 courses elected)	12	
Deduct for repetition	1	11

The studies of the Senior year are wholly elective, and cover a wide range. In addition to courses offered in philosophy, philology, and letters, in pure science, in history, and political science, the first-year courses in the Schools of Applied Science, Medicine, and Law are open to members of the Senior class who became students of the College not later than the beginning of their Junior year, and such as may desire to do so can prepare themselves for advanced standing in those schools by electing these first-year courses, as a whole or in part, and counting them for the degree of Bachelor of Arts.

The elections made by members of the Senior class are as in the following statement:

In Philosophy, Philology, and Letters:

Anthropology (1 course elected)		2
Education (5 courses elected)	10	
Deduct for repetition	6	4
English (6 courses elected)	33	
Deduct for repetition	9	24
German (8 courses elected)	13	
Deduct for repetition	5	8
Greek (5 courses elected)		5
Indo-Iranian (5 courses elected)	5	
Deduct for repetition	3	2
Latin (4 courses elected)	12	
Deduct for repetition	1	11
Literature (4 courses elected)	36	
Deduct for repetition	5	31
Music (2 courses elected)		5
Philosophy (3 courses elected)	15	
Deduct for repetition	1	14

Psychology (1 course elected)		3
Rhetoric (7 courses elected)	22	
Deduct for repetition	4	18
Romance Languages:		
French (3 courses elected)		5
Italian (3 courses elected)	3	
Deduct for repetition	1	2
Spanish (1 course elected)		2
Semitic (1 course elected)		2

In Pure Science:

Astronomy (1 course elected)		2
Botany (2 courses elected)		3
Chemistry (5 courses elected)	12	
Deduct for repetition	2	10
Geology (1 course elected)		2
Mathematics (2 courses elected)		3
Mechanics (1 course elected)		4
Mineralogy (2 courses elected)		2
Physics (3 courses elected)		6
Zoölogy (4 courses elected)	10	
Deduct for repetition	2	8

In History and Political Science:

History (7 courses elected)	46	
Deduct for repetition	13	33
Economics (7 courses elected)	51	
Deduct for repetition	17	34

In the Schools of Applied Science:

Civil Engineering (1 course elected)		1
Electrical Engineering (1 course elected)		2
Mechanical Engineering (8 courses elected)	9	
Deduct for repetition	7	2

In the School of Medicine:

The full first-year course, equivalent to 15 hours a week		4

In the School of Law:

The full first-year course, equivalent to 14 hours a week	5

There are two prizes for bestowal upon members of the graduating class: The Prize of the Alumni Association and the Chanler Historical Prize.

The three students nominated by the Faculty and submitted to the Senior class as candidates for the Alumni Prize of $50, given annually by the Association of the Alumni to "the most faithful and deserving student of the graduating class," were Harold Hosford Bowman, John Smith Harrison, and Montgomery Schuyler, Jr.; and John Smith Harrison was chosen by the class to receive the prize.

The Chanler Historical Prize, consisting of the income of a fund of $1000, bequeathed by J. Winthrop Chanler, of the Class of 1847, and given annually to that member of the graduating class who shall be the author of the best original manuscript essay in English prose on the history of civil government in America, or some other historical subject assigned by the Faculty, was awarded at Commencement to Charles Henry Tuttle for an essay upon "The Causes and Consequences of the Texas Uprising of 1833 to 1836."

Under the regulations, free tuition was granted during the past year to students:

In the Senior class	8
In the Junior class	9
In the Sophomore class	3

and reduced tuition to one Senior, two Juniors, one Sophomore, and two special students.

Remission or reduction of fees cannot be granted to any student during the first year of his connection with the University.

The whole number of applicants for admission who were examined at the College in the week ending June 17, 1899, was 173, distributed as follows:

Preliminary: those who take part of their examination and are candidates for the class entering in October, 1900	67
Final: those who took the preliminary examination a year ago and are candidates for the class entering in October, 1899	46
Full: those who take the entire examination at once and are candidates for the class entering in October, 1899	57
Special students	3
Total	173

The total number of applicants will be increased when the reports of examinations held at a distance from the College are received.

Five scholarships, of the annual value of one hundred and fifty dollars each during the College course, are open for competition to candidates for admission to the Freshman class who are examined at the College in June and pass complete entrance examinations in all subjects:

The Alumni Competitive Scholarship, open to all candidates. The papers of the candidates who pass a satisfactory examination are considered by the Committee on Admissions, and the one whose papers as a whole are entitled to the highest rank is awarded the scholarship. At the recent examinations, this scholarship was awarded to C. G. Abbott, from the Brooklyn Polytechnic Institute; general average, 95.2 per cent. of a possible maximum.

A Hewitt or Harper Scholarship, open for competition to graduates of the New York City High Schools. At the recent examinations, a Hewitt Scholarship was awarded to Alexander Otto Bechert, from the Boys' High School of the Borough of Brooklyn; general average, 82.8 per cent.

Three Brooklyn Scholarships, open for competition to candidates who are residents of Brooklyn, N. Y., and have received their training in either the public or the private schools of that borough. The papers of the qualified competitors who pass a satisfactory examination are considered by the Committee on Admissions, and the three candidates whose papers as a whole are entitled to the highest rank are awarded the scholarships. At the recent examinations these scholarships were awarded to: Edmond Jordan Harrison, from the Brooklyn Latin School, general average, 85.6 per cent.; Harold Chaffee McCallam, from the Brooklyn Latin School, general average, 81.4 per cent.; Samuel Abraham Tellzy, from the Boys' High School of Brooklyn, general average, 80.8 per cent.

The academic year 1897–98 was an exceptional one in the history of the College as to the number of students, and the number during the year just closed exceeded that of last by more than 20 per cent. While the candidates for admission, so far, are fewer than they were a year ago, yet the prospect is that the total number of students in attendance the coming year will exceed that of any previous year.

The whole tone and spirit of life in the College are very gratifying. The students generally exercise their large privilege of election in studies, under advice and judiciously; they appear to appreciate their numerous opportunities and to make the most of them.

The regulations with regard to exercise in the gymnasium under the control of the Physical Director have been of profit to the students, both physically and morally, and the rules with regard to outside athletic practice and contests have had a good effect.

The situation of the College and the requirements of the curriculum are such as to make it necessary for the students to remain a greater part of the day at the University or in its vicinity. For their good health, mental and physical, they should have better accommodations for their comfort and convenience than at present exist. Many of them have taken rooms in scattered localities in the neighborhood, but there is no distinctively college residence subject to proper control and under the general supervision of the University. It seems desirable, for the increased prosperity of the institution and the welfare of the students, that such residence or residences should be provided as early as practicable.

Measures have been taken looking to this end, but as yet have had no result.

There is another great desideratum toward the accomplishment of which nothing of consequence has yet been done. I refer, of course, to a worthy College Hall. The present building so designated is, as is well known, wholly inadequate to its purpose. It was intended as a temporary accommodation for the offices of College administration and for the departments of Greek, Latin, and Mathematics, as well as for a general meeting place and headquarters for the College students. With a student body exceeding four hundred in number and constantly increasing, it has largely lost its utility and is fast losing its individuality. It should be replaced by a suitable building; or preferably by two buildings, one on each side of the South Court, which might with propriety and significance be called College Court. Moreover, the present "College Hall" is wholly out of keeping with the fine buildings that have been erected for the various departments of science. In the interest of sound learning and thorough training it seems to me important that the work done by the College, which is necessary to the efficiency of the University as well as of the highest concern to the general wellbeing of society, should not only be encouraged, but should be so placed before the community that the community itself would not regard it as an indifferent matter in the general scheme of education here. The unworthy outward representation of the College on these grounds is not only a matter of disquietude to undergraduates and alumni alike, but conveys an erroneous impression to the public at large. I fear that the present financial condition of the institution may not permit the erection by the Trustees of a suitable College Hall at the present time. It is just possible, however, that the bequest of the late Charles Bathgate Beck, of the Class of '77, might be used, in whole or in part, for this object; in any event, it would seem as if a hearty recognition of the need of such a building on the part of the constituted authorities, and an appeal to the alumni and friends of Columbia to supply a deficiency which the Trustees would gladly make good if they were able, might excite a general interest that would bring about the desired result, or at least hasten its attainment.

Respectfully,
J. H. Van Amringe,
Dean.

June 28, 1899.

OFFICERS OF INSTRUCTION

Professors	29
Adjunct Professors	4
Instructors	7
Tutors	16
Lecturer	1
Assistants	16

SCHOOL OF LAW

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report of the work of the School of Law for the academic year ending June 30, 1899.

The favorable action taken by the Trustees upon the unanimous recommendation of the Faculty that admission to the School be limited after the academic year 1902–03 to graduates of colleges and scientific schools in good standing, and to persons presenting satisfactory evidence of equivalent training, is the realization of a hope long cherished by the Faculty and a suggestion made to the Trustees for their future consideration by the President in his annual report four years ago. This action is the logical result of the extension in 1888 of the course of study from two to three years, and of the successive measures adopted since that time raising the standards of admission to and of graduation from the School without regard to the requirements regulating admission to the Bar. The justification for all these measures, including the one last adopted, has been the conception that the University owes a duty to the profession and to the public not to be measured by the requirements regulating admission to the Bar. The practice of the law, which is in fact a privilege, has been regarded so much as a matter of right that restrictions of a most reasonable character have resulted in some States in reactionary movements dispensing with all requirements save proof of good moral character. The question, therefore, for the consideration of the State has been not so much what should be the requirements regulating admission to the Bar, as what could be safely required. The answer to this question has of course varied with the change in public opinion. Until the public can be brought to regard the law as a learned profession, demanding of one who would follow it attainments of a high order, the State cannot hope to raise effectually the requirements regulating admission to the profession. The action of the Trustees in requiring a college degree or evidence of equivalent training as a condition of admission to the School, emphasizes the fact that the law should be regarded as a learned profession, and will, I believe, tend to educate public opinion. As the holding of a degree in law is not a condition of admission to the Bar, the declaration of the Trustees that the degree of Bachelor of Laws should represent not only a professional but also a liberal education, can be legitimately criticised only by those who do not believe that a lawyer should be a man of so broad and liberal an education. The result of having a school composed of a body of men representing the highest and approximately the same standard of preliminary education, will be to raise the present high standard of scholarship and work, and to increase correspondingly the usefulness of the School in the cause of higher legal education.

Of the scholarships recently established by the Trustees, the Faculty are authorized to award four to applicants intending to enter the first-year class. The object in awarding scholarships to members of the first-year class is to attract to the School men of promise who would otherwise be unable to enter. If the scholarships serve their purpose, the School will not only render a service to the public in educating deserving young men, but the influence of the School will also be greatly increased and extended. Although the scholarships were established too late in the year for the fact to become extensively known, there were twelve applications filed and at least seven of the applicants were deserving of favorable consideration. I would respectfully recommend an increase in the number of scholarships offered to members of the first-year class.

I have to record the retirement of Professor Hardon, who returns to the practice of law after three years of service, characterized by a devotion and faithfulness in the discharge of his duties worthy of emulation. He will be succeeded by John W. Houston, Esq., of the New York Bar, who retires from the active practice of law to devote himself to the work of the School. Mr. Noble, who has done most earnest work as a lecturer in the School for four years, also retires because of his inability to take from his practice the time necessary to enable him to carry on his work as a lecturer. He will be succeeded by Harlan F. Stone, Esq., of the New York Bar, and a recent graduate of the School, who will also devote himself to the work of the School.

The following table gives the subjects in which candidates for the degree of Bachelor of Laws were examined at the close of the year, the names of the instructors, the number of lectures given per week in each subject, and the number of students examined therein :

Instructors	Courses	Hours per Week	Number of Students
	First Year		
Prof. Hardon	Common Law Pleading and Procedure	2*	118
Mr. Terry	Contracts	4	121
Mr. Chaplin	Criminal Law and Procedure	2	121
Prof. Keener	Elements of Jurisprudence	2	120
	Equity		120
Prof. Kirchwey	Real and Personal Property	2	121
Prof. Burdick	Torts	2	120
Mr. Noble	Domestic Relations and Law of Persons	2*	119

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* For half the year.

Instructors	Courses	Hours per Week	Number of Students
	Second Year		
Prof. Canfield	Agency	2	100
Mr. Noble	Bailments	2	93
Prof. Hardon	Code Practice	2*	3
Prof. Burgess	Comparative Constitutional Law	3	2†
Prof. Kirchwey	Quasi-Contracts	2	99
Prof. Keener	Equity	2	101
Prof. Hardon	Equity Pleading and Procedure	2*	5
Prof. Burdick	Negotiable Paper	2	101
Prof. Kirchwey	Real and Personal Property	2	102
Prof. Burdick	Sales of Personal Property	2	100
Prof. Goodnow	Administrative Law	2	6†
Prof. Smith	Institutes of Roman Law	2	0†
	Third Year		
Prof. Hardon	Code Pleading and Practice	2	8
Prof. Canfield	Doctrines Peculiar to New York Law	2*	11
Prof. Keener	Equity	2	97
Prof. Canfield	Evidence	2	99
Mr. Noble	Insurance	2*	14
Prof. Moore	International Law	2	3†
Prof. Burdick	Partnership	2	95
Prof. Keener	Corporations	2	97
Prof. Kirchwey	Real and Personal Property	2	90
Profs. Burdick and Kirchwey	Suretyship and Mortgage,	2	95
Prof. Hardon	Wills and Administration	2	87
Prof. Smith	Comparative Jurisprudence	2	1†
Prof. Goodnow	Municipal Corporations.	2*	0†
Prof. Goodnow	Law of Taxation	1	3†

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* For half the year.

† The records of the School of Political Science will show the number of law students taking this course as an optional or for degrees other than the degree of LL.B.

During the current academic year three hundred and forty-nine students were registered in the School of Law, exclusive of students registered primarily under other faculties, divided into classes or groups as follows.

Third Year	107
Second Year	105
First Year	133
Specials	4
Students registered in the Law School	349
Seniors of the College	5
Total	354

The following is the result of the examination of candidates for a degree held at the close of the year:

Of the ninety-nine members of the third-year class who presented themselves for examination, nine failed in one or more subjects, and therefore failed to receive the degree.

Of the five Seniors of the College who presented themselves for examination, one failed in three subjects.

Annexed hereto will be found tables showing the percentage of college graduates in each class and in the School as a whole, and the parentage of college degrees.

Respectfully,

William A. Keener,
Dean.

THIRD-YEAR CLASS.	Number of Students.	107
	College Graduates.	65
	Percentage of College Graduates.	60.75
SECOND-YEAR CLASS.	Number of Students.	105
	College Graduates.	63
	Percentage of College Graduates.	60.00
FIRST-YEAR CLASS.	Number of Students.	133
	College Graduates.	85
	Percentage of College Graduates.	63.91
SPECIAL STUDENTS.	Number of Students.	4
	College Graduates.	4
TOTAL NUMBER IN SCHOOL.	Total Number of Students in School.	349
	Total Number of College Graduates.	217
	Percentage of College Graduates.	62.18
TOTAL NUMBER OF COLLEGE GRADUATES IN SCHOOL.	Total Number of College Graduates in School.	217
	Number of Columbia College Graduates.	23
	Percentage of Columbia College Graduates.	10.60
	Number of Graduates of other Colleges.	194
	Percentage of Graduates of Other Colleges.	89.40

PARENTAGE OF DEGREES

Allegheny College	1
Amherst College	11
Bethel College	1
Bowdoin College	1
Brown University	2
Bucknell University	3
Centre College, Ky	2
Columbia College	23
Cornell College, Ia	1
Crozer Theological Seminary	1
Curry University	1
De Pauw University	1
Emory College	1
Eureka College	2
Georgetown University	2
Guilford College	1
Hamline University	1
Hanover College, Ind	2
Harvard University	22
Haverford College	1
Hobart College	3
Illinois College	1
Johns Hopkins University	2
Knox College	1
Leland Stanford Jr. University	7
McGill University, Canada	1
McMinnville College, Ore	1
Manhattan College	2
Mount St. Mary's College, Md	1
New York City College	31
New York University	4
Notre Dame University	1
Oberlin College	3
Oxford University, England	1
Princeton University	5
Ripon College	1
Roanoke College	1
Rutgers College	1
St. Francis Xavier's College	8
St. John's College, Md	1
Seton Hall College	1
Swarthmore College	1
Trinity College, Conn	1
University of California	2
University of Colorado	1
University of Iowa	2

University of Kansas	1
University of Michigan	2
University of Minnesota	1
University of Missouri	1
University of Nebraska	1
University of North Dakota	1
University of Ohio	1
University of Rochester	2
University of Virginia	1
U. S. Naval Academy	1
Wabash College	1
Wesleyan University, Conn	1
Williams College	11
Yale University	28

60 Colleges and Universities. Total Graduates, 217

SCHOOL OF MEDICINE

COLLEGE OF PHYSICIANS AND SURGEONS

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report of the condition of the Medical School, and the work done during the past year.

There have been 738 students in the School in attendance upon the lectures and working in the various laboratories, distributed as follows:

First-year students	201
Second-year students	161
Third-year students	179
Fourth-year students	140
Special students	57
	738 *

Of these 302 held degrees as follows:

A.B.	180
A.B., A.M.	13
A.B., A.M., M.D.	1
A.M.	2
A.B., M.D.	2
A.M., M.D.	1

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* Of these 8 withdrew during the year.

B.S.	53
B.P.	2
B.L.	2
B.S., Ph.D.	1
B. Agr.	1
C.E., Ph.G.	1
Ph.B.	11
Ph.G.	10
Phar.D.	1
Ph.G., M.D.	2
M.S.	1
M.Sc., M.D.	1
M.D.	14
M.E.	1
LL.B.	1
V.S.	1
	302

DEPARTMENT OF ANATOMY

1. *Educational Staff*

No changes have taken place in the educational staff of the Department during the current year.

The plan of annually appointing a number of the older undergraduates as student-demonstrators in anatomy has now been in operation for two years. The results have been very satisfactory. This increase in the teaching force is of especial value in conducting the practical anatomical work during the evening sessions.

2. *Courses*

The usual practical and didactic courses of the medical curriculum have been given during the year. The additional cold-storage rooms erected last year for the collection and preservation of anatomical material during the summer months made it possible to materially raise the required standard of the practical anatomical work during the present session.

A considerable number of new optional courses in Human and Comparative Morphology were offered this year under the Faculty of Pure Science.

The attendance on these courses has been unusually large, both on the part of candidates for the A.M. and Ph.D. degrees and of medical undergraduates electing additional courses as optional work.

3. *Museum and Research Work*

The Department has continued the development of the Human and Comparative Anatomical Museum during the year. A large number of valuable preparations have been added to the collection, and several of the series most used in the undergraduate courses of instruction have received valuable additions.

It is a matter of profound regret that the insufficient equipment of the anatomical building in the matter of museum cases not merely prevents the serial exhibition which makes the museum an educational factor of the first importance to the student, but also entails loss and deterioration in preparations which will be difficult and costly to replace in the future. The Department earnestly recommends the acquisition of sufficient cases to provide at least adequate and safe storage-room for the collection.

During the last week in December the Association of American Anatomists met at Columbia University in conjunction with the affiliated scientific societies. The following papers were presented by officers of the Department at this meeting:

Geo. S. Huntington: "Morphology and Phylogeny of the Vertebrate Ileo-colic Junction."

Geo. S. Huntington: "On the Cerebral Fissures and the Visceral Anatomy of the Eskimo from Smith's Sound."

Geo. S. Huntington: "Visceral and Vascular Variations in Human Anatomy."

Geo. S. Huntington: "Contribution to the Anatomy of the Reptilian Vascular System."
Geo. S. Huntington: "The Sternalis Muscle."
Geo. S. Huntington: "Genito-urinary System of the American Pit-vipers."
Jos. A. Blake: "Development and Structure of the Metencephalon."
W. K. Martin: "Examination of the Cæcum and Appendix in 100 Subjects."
Geo. E. Brewer: "Surgical Relations of the Duodenal Orifice of the Common Bile-duct."

Dr. A. Hrdlicka also presented a paper on the normal human tibia based on extensive researches which he has carried on during the past two years in the Osteological Reference Collection of the Department.

The Association, in response to a request received from the English editors of the *Journal of Anatomy and Physiology,* nominated Prof. Huntington as American editor of the *Journal.*

Prof. Huntington was appointed as representative of the Association in the joint discussion of the Affiliated Scientific Societies on "Advances in Methods of Teaching," held in Schermerhorn Hall on the afternoon of December 30th.

Dr. Blake represented the Department in the Annual Exhibition of the New York Academy of Science, taking charge of the Anatomical section.

4. *Library*

The Departmental library has received a second valuable gift of anatomical works from Dr. F. H. Markoe, of this city. A number of volumes have been added by purchase during the year, and the collection is of great practical value in direct connection with the laboratory and research work of the Department.

5. *Work of Fellow in Anatomy*

Dr. Blake, the present incumbent of the Alumni Association Fellowship, has concluded a very interesting and important series of observations on the structure of the metencephalon. The results of this valuable research were presented to the Association of American Anatomists at their last meeting and are to be published shortly in the *Journal of Comparative Neurology*.

Dr. Blake was reappointed to the Fellowship and will during the coming academic year undertake a research on the development and structure of the mammalian lung.

DEPARTMENT OF PHYSIOLOGY

Since the last report Colin Campbell Stewart, B.A. of the University of Toronto, Ph.D. of Clark University, has been appointed Tutor in Physiology, to date from July 1, 1898, vice Reid Hunt, Ph.D., M.D., resigned.

Instruction has been given by Professors J. G. Curtis and F. S. Lee and Dr. C. C. Stewart. The following is a summary of the courses given during the year:

Course		No. of Students, with Candidacy for Degree	
I. General Physiology	5	Ph.D.	1
		A.M.	4
II. Physiology of Man and Higher Vertebrates,		M.D.	355
III. Laboratory work of Course I	5	Ph.D.	1
		A.M.	4
IV. Research	12	A.M.	4
		Special	8
Total			377
Names repeated			5
Corrected total			372

The researches carried on in the Department by the members of the staff and workers under their direction were upon the following subjects:

The history of the discovery of the nervous system.

The nature and cause of muscle-fatigue.

A histological comparison of red and pale muscles.

The survival of mammalian muscle.

Inhibition of muscular contraction.

The inhibitory nerve-supply of the bladder in the cat.

A method of studying the physiology of mammalian smooth muscle.

Post-mortem changes in nerve-cells.

The cause of death from industrial electric currents.

The action of currents of high frequency and high potential on the normal and on the fibrillating heart.

The physiological action of oscillatory currents of high potential.

The progress of peristalsis in the œsophagus.

The absorption of strychnine from the several parts of the intestinal canal of the dog.

The physiological action of the saliva of *Heloderma suspectum.*

The action of cathartic drugs when given hypodermatically.

The absorption of proteids.

The action of anæsthol and ethyl chloride upon the kidneys.

The following publications by workers in the Department appeared during the year :

F. S. Lee, Ph.D.—The Ear and the Lateral Line in Fishes. In *Report of the Sixty-Seventh Meeting of the British Association for the Advancement of Science, held at Toronto in August, 1897*, p. 811.

The New York Meeting of the American Physiological Society. *Science*, N. S., ix, p. 286.

Review of Peabody's "Laboratory Exercises in Anatomy and Physiology." *Science*, N. S., ix, p. 331.

General Physiology: An Outline of the

Science of Life. By Max Verworn. Translated from the second German edition and edited. London and New York: The Macmillan Co., pp. xvi + 615.

The Nature of Muscle-Fatigue. In Proceedings of the American Physiological Society, New York, Dec. 28–30, 1898. *The American Journal of Physiology*, ii, p. xi.

Muscle-fatigue. In Proceedings of the Fourth International Physiological Congress, held at Cambridge, England, August 23–26, 1898. *The Journal of Physiology*, xxiii, supplement, p. 61.

C. C. Stewart, Ph.D.—On the Course of Impulses to and from the Cat's Bladder. *The American Journal of Physiology*, ii, p. 182.

A Simple Etherizing Bottle. In Proceedings of the American Physiological Society, New York, Dec. 28–30, 1898. *The American Journal of Physiology*, ii, p. x.

R. H. Cunningham, M.D.—The Absorption of Fat after Ligature of the Biliary and Pancreatic Ducts. *The Journal of Physiology*, xxiii, p. 209.

A Note on the Wehnelt Interrupter. *Electrical World and Electrical Engineer*, April 29, 1899, p. 542.

S. J. Meltzer, M.D.—On the Influence of Fasting upon the Bactericidal Action of the Blood. *Journal of Experimental Medicine*, iv, p. 131.

On the Causes of the Orderly Progress of the Peristaltic Movements in the Œsophagus. *The American Journal of Physiology*, ii, p. 266.

R. C. Kemp, M.D.—Intestinal Irrigation with Normal Salt Solution, Double-current Method. In Baruch's *Principles and Practice of Hydrotherapy*, New York, Wm. Wood & Co., p. 239.

W. H. Thomson, M.D., LL.D., and R. C. Kemp, M.D.—Case of Chronic Infective Endocarditis, with

Streptococci Found in the Blood before Death, Treated with Antistreptococcus Serum, and Experiments on the Effects of Injections of Serum and of Antitoxins upon the Kidneys. In *Transactions of the Association of American Physicians, thirteenth session, held at Washington, D.C., May 3, 4, and 5, 1898*, xiii, p. 399.

Experimental Researches on the Effects of Different Anæsthetics on the Kidneys. *The New York Medical Record*, liv, p. 325.

DEPARTMENT OF PHYSIOLOGICAL CHEMISTRY

The Department of Physiological Chemistry, organized a year ago, has been in successful operation during the present academic year, and has given a course in Physiological Chemistry to all of the second-year men. The course has consisted of a combination of instruction by didactic lectures, conferences, and recitations, and practical work in the laboratory. One hundred and fifty-one regular students of the second year and three graduate students have taken the course in its entirety, while a few special students and two research workers have made use of the laboratory and its facilities during the year.

In order to accomplish the best results, and with especial reference to having the men attending lectures working in the laboratory on the topics under discussion, two similar courses have been given; one half of the class taking the first course, and the second half of the class taking the second course. By this arrangement, each regular student of the second-year class has had a course in Physiological Chemistry extending through thirteen weeks, or one half of the academic year, with three laboratory exercises of two hours each per week, one conference, and one lecture a week.

The weekly lectures have been given by Professor Chittenden, while the weekly conferences have been held by Dr. W. J. Gies, and the instruction in the laboratory has been given by Dr. Gies and Messrs. A. N. Richards and A. C. Eustis.

The routine work connected with the equipment of this Department, and its organization for regular work, has naturally consumed much of the instructors' time, so that opportunity for research work in this Department has not been as great this year as was hoped for. Dr. Gies, however, has carried on some experiments on the influence of tellurium compounds on animal metabolism. Mr. Richards has been occupied with a study of the influences governing the formation and excretion of creatinin, and Mr. Eustis with a study of the formation of hexone bases, etc., in the decomposition of the albuminoid elastin. Dr. P. A. Levine has likewise been carrying on research work in the laboratory, studying especially the decomposition of various proteids; he has also studied the nature of the nucleo-proteids and nuclein present in brain tissue, and also the composition of the eggs of certain fishes. The results of these various pieces of work will soon be published (in part at least) in some of the physiological journals.

DEPARTMENT OF PATHOLOGY

In the Department of Pathology, in which are grouped Pathology, Clinical Microscopy, Bacteriology, and Normal Histology, routine undergraduate and special instruction has been given as usual.

Instruction in Pathology has been given in two sections to one hundred and seventy-four men; while sixteen men aside from our regular working force have been engaged in research in Pathology and Medical Bacteriology. The class in Clinical Microscopy, taught in four sections, consisted of one hundred and forty regular and three special students. The class in Bacteriology numbered one hundred and fifty-six and was also taught in four sections. The advanced course in Bacteriology was taken by three men, one of whom was a candidate for a higher degree. The first-year class in Normal Histology, taught in two sections, numbered one hundred and sixty-six, while the second-year class numbered one hundred and fifty-nine. In Photography there has been one special student, while one candidate for a higher degree has been engaged in those phases of bacteriology which are related to sanitary engineering.

Thus altogether in the Department of Pathology, undergraduate instruction in the various themes has been given in classes to 798 men, while 21 men have been engaged in special advanced studies and in research.

The growth of our collection of demonstration material for the classes and for reference has been secured as usual by the examination of specimens from many sources, followed, when called for, by a formal report. Altogether our accession book shows that from all sources over 1600 specimens have been received and examined during the academic year.

In the section of Photography, a large number of lantern slides and photomicrographs for scientific purposes has been made; the collection of negatives, over 2000 in number, has been rearranged and card-catalogued; the X-ray apparatus has been improved; and a set of negatives, positives, and plates, illustrating various methods of "process reproduction," has been added to the collection.

The Departmental library has been maintained this year as usual by the private subscriptions of the workers in the Department, but it is highly important that its support should be assumed in part, at least, by the University.

The following are the more important papers published by workers in this Department since the last report:

Pearce Bailey, M.D.—Pathological Report of a Case of Akromegaly, with Especial Reference to the Lesions in the Hypophysis Cerebri and in the Thyroid Gland; and of a Case of Hemorrhage into the Pituitary. *Philadelphia Medical Journal*, April 30, 1898.

Hemiatrophy of the Brain without Disturbances of Intelligence or Personality. *The American Journal of the Medical Sciences*, March, 1899.

T. M. Cheesman, M.D., with Meltzer, *infra.*—An experimental Study of the Direct Inoculation of Bacteria into the Spleen of Living Animals, etc.

R. Denig, M.D.—On the Histology and Etiology of Posterior Lenticonus. *Ophthalmic Record*, April, 1899.

James Ewing, A.M., M.D.—Notes on Clinical Diagnosis. Preliminary Report on the Results of Blood Examinations at Camp Wikoff, August and September, 1898. *New York Medical Journal*, January 28 and February 4, 1899.

Studies on Ganglion Cells. *Archives of Neurology and Psychopathology*, i, 1898.

R. G. Freeman, M.D.—Focal Necrosis in the Liver following Measles in Children. *Trans. New York Pathological Society*, 1898–99.

Eugene Hodenpyl, M.D.—A Case of Apparent Absence of the Spleen, with General Compensatory Lymphatic Hyperplasia. *Medical Record*, November 12, 1898, p. 695.

Gustave Langmann, M.D.—Hæmosporidia in American Reptiles and Batrachians. *New York Medical Journal*, January 7, 1899.

J. H. Larkin, M.D.—A Case of Complete Stenosis of the Œsophagus from Carcinoma. *Trans. of New York Pathological Society*, October 12, 1898.

Report of Three Cases of Tumors of Œsophagus. *Ibid.*, February 25, 1899.

A Case of Hemorrhagic Pancreatitis with Fat Necrosis.

A Case of Suppurative Pancreatitis with Rupture of Pancreatitic Duct into Stomach.

A Case of Suppurative Pancreatitis with Abscess in Stomach Wall—Involvement of Spleen and Fatal Hemorrhage. *Ibid.*, March 8, 1899.

Two Cases of Gangrenous Bronchitis—with Norris, *infra.*

S. J. Meltzer, M.D., with Cheesman, *supra.*—An Experimental Study of the Direct Inoculation of Bacteria into the Spleen of Living Animals; and a Contribution to the Knowledge of the Importance of a Lesion in Animal Tissue for the Lodgment and Multiplication of Bacteria within it. *Journal of Experimental Medicine*, iii, Nos. 4 and 5.

On the Influence of Fasting upon the Bactericidal Action of the Blood—with Norris, *infra.* *Journal of Experimental Medicine*, iv, No. 1.

Charles Norris, Ph.B., M.D.—A Report on Six Cases in which the Bacillus Aërogenes Capsulatus was Isolated. *American Journal of the Medical Sciences*, February, 1899.

Preliminary Report on Two Cases of Gangrenous Bronchitis with Isolation of an Organism related to Streptothrix—with Larkin, *supra.* *Trans. of New York Pathological Society*, March 8, 1899.

On the Influence of Fasting upon the Bactericidal Action of the Blood—with Meltzer, *supra.*

Francis Carter Wood, M.D.—Puerperal Infection with the Bacillus Aërogenes Capsulatus. *New York Medical Record*, 1899, lv, p. 535.

Volume VI of the collected "Studies from the Department of Pathology" has been issued during the year.

DEPARTMENT OF OBSTETRICS

The instruction in Obstetrics to second-year students has been carried on as usual in the form of recitations and demonstrations by Dr. Tucker.

During the past year a slight change has been made in the method of instruction as usually given to the third-year students. Instead of three didactic lectures per week, during a large part of the session, two didactic lectures and one clinical lecture per week have been given by Dr. Cragin;

the clinical lectures being delivered in the Vanderbilt Clinic, and the material from the Sloane Maternity Hospital utilized with apparent marked interest on the part of the students.

The fourth-year class as usual has enjoyed the privilege of a two-weeks' residence at the Sloane Maternity, and daily practical instruction by Dr. Voorhees.

During the past year 152 patients were delivered by students, and 538 deliveries were witnessed by the class in section.

Twelve physicians, graduates of the College, who had already served as internes in the general hospitals of the city, availed themselves of the opportunity to study practical midwifery, by serving each three months, as assistants to the resident physician, in the Sloane Maternity Hospital, thus obtaining a most valuable experience. Nurses from the Roosevelt, St. Luke's, the Presbyterian, and Mt. Sinai hospitals have received obstetric training under the guidance of the accomplished principal of the training-school, Miss Van Kirk.

DEPARTMENT OF SURGERY

The curriculum in Surgery has been further improved during the past year in the matter of clinical teaching at the New York Hospital by Professors Bull and Weir.

The operations performed in the presence of the students have been much limited in number, and greater stress has been laid on the differential diagnosis of the most important surgical diseases, with illustrative cases drawn from the wards, as well as on the various need of operative intervention. This grade of instruction, given thus by the heads of this Department, represents the culmination of the clinical surgical teaching of the College, which, beginning with the instruction by Dr. Eliot in minor surgery at the Vanderbilt Clinic, is developed further at the same place by Professors Bull and Weir, and carried to a still higher plane at the hospital bedside at Bellevue by Drs. Markoe, Gallaudet, and Hotchkiss. This represents an admirably arranged course of practical instruction, which is only marred by the fact—to be remedied, it is hoped, in the future—that the students are compelled to proceed to distant institutions, rather than to be centred in their teaching at the Roosevelt Hospital, opposite the College buildings. The didactic teaching of the chair remains the same, but it is planned, instead of, as now, two lectures being given each week at the College, to have but one didactic lecture given there, and, in lieu of the second, an additional clinical lecture a week, at the New York Hospital, with recitations from a selected text-book several times a week at the College, for the first-term students in Surgery.

DEPARTMENT OF DISEASES OF CHILDREN

The regular Wednesday clinics of Professor Jacobi have been well attended. The material for instruction carefully selected by the Chief of Clinic and his assistants has been sufficient to furnish ample opportunities to teach all the forms of disease encountered in infancy and childhood. The practical courses given by Dr. Huber three times a week to classes consisting of 17 students each, have offered opportunities for the personal examination of patients. The examination accompanying each lesson was greatly appreciated by the students.

The two weekly clinics held in the newly established "Jacobi Ward" of the Roosevelt Hospital added greatly to the advantage of the fourth-year students. Classes corresponding with those instructed by Dr. Huber in the Vanderbilt Clinic were taught and made to examine at the bedside by Professor Jacobi. This new departure in the curriculum of the fourth year proved highly satisfactory to the students, who expressed their gratification at the end of the course in a letter to the Professor.

The courses of didactic lectures on materia medica, practice of medicine, and diseases of the nervous system have been continued without interruption during the year, by Professors Peabody, Starr, and Delafield.

The Vanderbilt Clinic continues to furnish vast facilities for studying disease in the forms met with in a dispensary but not seen in a hospital. Section teaching has been given daily in all the special departments of Medicine and Surgery in the clinic building.

The four years' course, now well arranged, is working in a satisfactory manner, and the outlook for the future of the College was never brighter.

Respectfully,
JAMES W. MCLANE, *Dean.*

SCHOOL OF MINES
SCHOOL OF CHEMISTRY
SCHOOL OF ENGINEERING
SCHOOL OF ARCHITECTURE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to present the following report of the thirty-fifth annual session of the Schools under the Faculty of Applied Science, just closed.

During the year, four hundred and fifty-nine students have been in attendance on the exercises of the Schools under this Faculty, distributed as follows:

Undergraduate Courses.		
Fourth Class	42	
Third Class	63	
Second Class	118	
First Class	190	
		413
University Courses.		
For the Degree of Master of Arts	14*	
" " " " Doctor of Philosophy	2	
		16
Carried forward		429

* Eight of this number were also students in regular undergraduate courses.

Brought forward	429

Elective Courses

Specials (15 of whom pursued Architectural Courses)	38
Grand total	467
Deduct for students pursuing more than one course,	8
Students primarily registered under this Faculty,	459

The regular undergraduate students have pursued the different courses in the Schools under the Faculty of Applied Science, as follows:

	First Class	Second Class	Third Class	Fourth Class	Total
SCHOOL OF MINES:					
Mining Engineering	31	21	10	5	67
Metallurgy	0	0	1	0	1
SCHOOL OF CHEMISTRY	10	10	9	5	34
SCHOOL OF ENGINEERING:					
Civil Engineering	26	15	11	9	61
Electrical Engineering	53	39	25	18	135
Mechanical Engineering	30	8	0	0	38
SCHOOL OF ARCHITECTURE	40	25	7	5	77
	190	118	63	42	413

Of the above-mentioned students the following number received free tuition:

First Class	10 * † ‡
Second Class	16 §
Third Class	11 ⊕
Fourth Class	5 ⊕
	42

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* Three Pulitzer Scholarships

† One free for first half-year only

‡ One free for second half-year only

§ Two Pulitzer Scholarships

⊕ One Pulitzer Scholarship in each class

The following table shows the number of students who have attended the School of Mines and associated Schools since their foundation:

	M.E.	Met.	Geol.	Chem.	C.E.	S.E.	E.E.	Mech E.	Arch.	Special.	Not Stated.	Graduate.	Total.	Studied in two Courses.*	Actual No. of Students.
1864–5..	.....	...	...	....	.....	...	....	...	...	...	...	...	47	....	47
1865–6..	30	...	...	....	.....	...	....	...	...	45	23	...	98	....	98
1866–7..	41	...	1	1	.....	...	....	...	...	53	27	...	123	....	123
1867–8..	39	...	1	2	.....	...	....	...	...	43	23	...	108	....	108
1868–9..	26	...	1	3	.....	...	....	...	...	25	33	...	88	1	87
1869–70.	22	...	...	5	1	...	....	...	...	25	24	...	77	2	75
1870–1..	17	...	...	8	1	...	....	...	...	44	31	...	101	4	97
1871–2..	22	...	1	5	2	...	....	...	...	62	29	...	121	3	118
1872–3..	33	1	1	7	10	...	....	...	...	38	47	...	137	4	133
1873–4..	69	6	1	12	34	...	....	...	...	25	46	...	193	28	165
1874–5..	81	2	1	16	60	...	....	...	...	22	62	...	244	44	200
1875–6..	91	...	1	25	69	...	....	...	...	28	61	...	275	49	226
1876–7..	94	...	2	24	51	...	....	...	...	20	69	...	260	30	230
1877–8..	92	1	5	42	55	...	....	...	...	18	71	7	291	45	246
1878–9..	79	...	1	53	58	...	....	...	...	26	75	16	308	44	264
1879–80.	67	...	...	66	26	...	....	...	...	40	78	11	288	....	288
1880–1..	84	...	...	51	24	...	....	...	...	...	87	16	262	....	262
1881–2..	111	...	...	35	28	...	....	...	2	...	95	3	274	....	274
1882–3..	114	...	1	34	27	...	....	...	11	1	80	8	276	....	276
1883–4..	155	...	3	52	52	...	....	...	27	...	...	1	290	....	290
1884–5..	115	3	2	50	61	...	....	...	35	...	...	3	269	....	269
1885–6..	84	4	...	50	71	...	....	...	29	...	...	2	240	....	240
1886–7..	67	6	3	56	89	2	....	...	45	...	...	19	287	....	287
1887–8..	42	8	2	37	91	2	....	...	53	...	...	8	243	....	243
1888–9..	41	8	2	35	82	...	....	...	63	5	...	7	243	....	243
1889–90.	38	7	2	34	78	1	19	...	76	...	...	5	260	....	260
1890–1..	40	7	3	35	86	1	14	...	70	12	...	9	277	....	277
1891–2..	53	5	3	26	102	1	9	...	72	33	...	21	325	....	325
1892–3..	49	4	2	22	82	1	64	...	82	24	...	7	337	....	337
1893–4..	52	4	1	27	80	...	96	...	75	38	...	7	380	....	380
1894–5..	60	5	...	22	84	...	116	...	74	27	...	11	399	....	399
1895–6..	49	5	...	22	67	...	121	...	77	29	...	5	375	1	374
1896–7..	48	4	...	28	72	...	137	...	82	22	...	6	399	2	397
1897–8..	57	3	...	35	75	...	141	14	76	18	...	13	432	2	430
1898–9..	67	1	...	34	61	...	135	38	77	38	...	16	468	8	459

The table exhibits continued increase in the total number of students. The number this year is the largest since the foundation of the School of Mines. The course in Electrical

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* Formerly the first year was the same for all courses, and students were not required to elect their course of study till the following year.

Engineering is, as usual, the leading course in point of numbers. The new course in Mechanical Engineering, which began last year with a class of fourteen, shows a healthy growth. The other courses, for the most part, maintain about the same numbers of students as in previous years.

The following is a complete list of the degrees awarded at Commencement in the several courses:

Undergraduate Courses		
School of Mines:		
Engineer of Mines	9	
Metallurgical Engineer	1	
School of Chemistry:		
Bachelor of Science	6	
School of Engineering:		
Civil Engineer	13	
Electrical Engineer	24	
School of Architecture:		
Bachelor of Science	14	
		67
University Courses		
Master of Arts*		8
		75
Deduct for graduates receiving more than one degree		4
Total graduates		71

The above includes the following degrees which were granted during the year to candidates who failed to comply with all the requirements at last Commencement:

Engineer of Mines	3	
Civil Engineer	4	
Electrical Engineer	3	
Bachelor of Science (in Chemistry)	1	
		11

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* Four of whom received also the degree of Electrical Engineer.

The following table shows the number of graduates in the different courses of study since the foundation of the School of Mines:

	M.E.	Ph.B. or Met. Eng.	Ph.B. (Geol.)	Ph.B. or B.S. (Chemistry.)	C.E.	S.E.	E.E.	Ph.B. or B.S. (Architecture.)	A.M.	Ph.D.	Degrees Taken.	Took more than one Degree.	Graduates.
1867........	1	....	...	....	....	...	.....	....	...	...	1	....	1
1868........	14	....	...	....	....	...	.....	....	...	...	14	....	14
1869........	21	....	...	....	....	...	.....	....	...	...	21	....	21
1870........	9	....	...	....	....	...	.....	....	...	1	10	....	10
1871........	8	....	...	1	....	...	.....	....	...	...	9	....	9
1872........	8	....	...	....	....	...	.....	....	...	...	8	....	8
1873........	6	1	...	2	....	...	.....	....	...	...	9	2	7
1874........	7	....	...	....	1	...	.....	....	...	...	8	....	8
1875........	10	1	1	5	5	...	.....	....	...	1	23	4	19
1876........	15	....	...	3	16	...	.....	....	...	3	37	13	24
1877........	29	....	...	....	27	...	.....	....	...	6	62	26	36
1878........	26	....	2	10	6	...	.....	....	...	2	46	7	39
1879........	20	....	1	5	8	...	.....	....	...	3	37	3	34
1880........	15	....	...	11	9	...	.....	....	...	9	44	10	34
1881........	14	....	...	22	8	...	.....	....	...	2	46	3	43
1882........	23	....	...	12	5	...	.....	....	...	4	44	7	37
1883........	22	....	...	5	7	...	.....	....	...	4	38	5	33
1884........	37	....	...	9	15	...	.....	5	...	5	71	10	61
1885........	37	....	1	3	4	...	.....	3	...	1	49	2	47
1886........	16	....	...	4	9	...	.....	5	...	2	36	3	33
1887........	22	2	...	11	13	...	.....	4	...	2	54	3	51
1888........	5	2	...	15	14	...	.....	8	...	1	45	3	42
1889........	14	....	1	6	19	2	.....	11	...	2	55	4	51
1890........	6	6	...	6	17	...	.....	17	...	6	58	4	54
1891........	5	....	...	3	12	...	5	11	3	1	40	5	35
1892........	9	....	1	6	18	...	7	5	9	...	55	10	45
1893........	8	....	1	2	13	...	3	13	3	2	45	3	42
1894........	6	....	1	5	17	...	12	15	1	6	63	6	57
1895..... ..	13	1	...	4	22	...	13	16	...	7	76	....	76
1896........	12	1	...	4	9	...	15	17	2	...	60	2	58
1897........	6	....	...	3	15	...	26	9	4	...	63	2	61
1898........	19	2	...	5	20	...	23	15	6	...	90	....	90
1899........	9	1	...	6	13	...	24	14	8	...	75	4	71
	472	17	0	168	322	2	128	168	36	70	1392	141	1251

Graduates of other institutions to the number of sixty-eight have been in attendance at the Schools of Applied Science during the past year. The following is a list of the institutions from which they graduated and the degrees which they have received :

PARENTAGE OF DEGREES

Alabama Polytechnic Institute	1
Amherst College, Amherst, Mass	1
College of the City of New York	13
Columbia University	13
Eureka College	1
Harvard University, Cambridge, Mass	3
Indiana University	1
Johns Hopkins University, Baltimore, Md	2
McGill University	1
Memphis Law School, Memphis, Tenn	2
Montana State College	1
Nevada State University	1
Pennsylvania Military College, Chester, Pa	1
Princeton University, Princeton, N. J	2
Rose Polytechnic Institute, Davenport, Iowa	1
St. Francis Xavier College, New York City	3
St. John's College, Fordham, N. Y	1
Stanford University	1
Trinity College, Hartford, Conn	2
United States Naval Academy, Annapolis, Md	1
University of Minnesota, Minneapolis, Minn	1
Wesleyan University	1
Williams College, Williamstown, Mass	2
Yale University, New Haven, Conn	11
	67
Foreign Countries :	
Cambridge University	1
Gymnase Coutanah de Neuchatel, Switzerland	1
Munich Polytechnikum	1
Real Schule Gratz, Austria	1
University of Havana, Havana, Cuba	1
	72
Deduct for students holding more than one degree	4
	68

Number holding degree of A.B	35
“ “ “ “ A.M	3
“ “ “ “ B.L	1
“ “ “ “ B.S	17
“ “ “ “ C.E	4
“ “ “ “ E.E	3
“ “ “ “ E.M	3
“ “ “ “ LL.B	1
“ “ “ “ Ph.B	4
“ “ “ “ U. S. Naval Academy	1
	72
Deduct for students holding more than one degree	4
	68

During the year three hundred and seventeen students applied for admission to the Schools under this Faculty, as follows:

Admitted, on full or final examination	127
Admitted by certificate or diploma*	72
Refused admittance	49
Took preliminary examination only	69
	317

Admitted to regular courses:		
First Class	131	
Second Class	19	
Third Class	6	
Fourth Class	2	
		158
Admitted as special students in		
Mining Engineering	7	
Civil Engineering	2	
Electrical Engineering	2	
Metallurgy	2	
Architecture	13	
		26

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* Does not include the whole number so admitted, as the reports from the examining officers do not give this information in all cases. Candidates presenting regents' diplomas and certificates are included among those "admitted on examination."

Admitted as graduate students for

Master of Arts	3
Total new students	187
Admitted, but did not enter*	12
Total admitted	199

The students entering the regular courses were admitted as follows:

Admitted without conditions	54
Conditioned in one or two subjects	58
“ “ more than two subjects	46
	158

Of the students admitted, sixteen were less than eighteen years of age, of whom two were between sixteen and seventeen.

The more important legislation by the Faculty during the year may be summarized as follows:

1. The introduction of an improved system of registration, by which it is possible to secure more prompt enrollment of the students in the different classes.
2. The introduction of a system of reporting and recording the attendance of students, permitting the better enforcement of the by-laws.
3. The establishment of Benefactors and Faculty Scholarships to the number of thirty-five, in lieu of free tuition heretofore granted, and the adoption of regulations for the award of these scholarships.
4. Modification of the requirements for admission by permitting the substitution of Latin or Spanish in lieu of French.

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* One of these was granted leave of absence for a year in order to continue his studies in the preparatory schools.

DEPARTMENT OF ASTRONOMY

The regular courses of instruction in geodesy were given to students of civil engineering as usual. The summer school in practical geodesy was in session from June 1st to July 12th at Osterville, Mass. The work was under the direction of the adjunct professor of astronomy, with the assistance of Charles Derleth, C.E., and W. C. Kretz, A.M. Ten students were in attendance.

The Department is in need of instruments of latest design for base measuring and angle work.

DEPARTMENT OF ARCHITECTURE

There have this year been no changes of note in the conduct of the Department of Architecture. The instructors have been the same as last year, and the number of students, both regular and special, has been about the same. The only change in the courses of study is that the instruction in Specifications and Building Materials, which has been given in the first three years, occupying two hours a week, will now be concentrated in the third year, occupying four hours a week, with three hours in the draughting-room besides.

The unprecedented advantages offered to our students by the Avery Library and by the helpful and liberal spirit in which it is administered are having a marked effect upon the character of their work. This is especially the case during the six or eight weeks which are every spring devoted to historical research. The drawings made and the papers prepared in connection with them testify to the value of these opportunities and the diligent use made of them. The Library thus becomes a part of the regular apparatus of instruction, and the draughting-room which has been provided in conjunction with the Library greatly enhances its value. It serves also as a classroom whenever any subject is in hand for which these books are needed. It serves also as a conference room for the weekly exercises of the fourth-year men, who here read the essays which form a chief part of their winter's work, and for which the books they have consulted often furnish indispensable illustration.

DEPARTMENT OF CHEMISTRY

The following changes were made in the corps of instructors in this Department at the beginning of the present year:

John Alexander Mathews, M.S., Ph.D., Tutor in Chemistry in the School of Medicine, in place of Francis Pitt Smith, Ph.B., resigned.

Leon Laizer Watters, B.S., Assistant in Chemistry in the School of Medicine in place of Benjamin M. Jaquish, Ph.B., resigned.

Milton C. Whitaker, B.S., Tutor in Chemistry, in place of Arthur P. Van Gelder, Ph.B., resigned.

Victor Lenher, Ph.D., Assistant in Analytical Chemistry, Qualitative, in place of Edwin C. Holden, E.M., resigned.

Frederick Sackett Hyde, Ph.B., Assistant in Analytical Chemistry, Quantitative, in place of Henry C. Sherman, Ph.D., resigned.

Emil Justus Riederer, B.S., Assistant in Analytical Chemistry, Assaying, in place of Charles H. Fulton, E.M., resigned.

Twenty-eight different courses of instruction in Chemistry were offered by the Department. Of these, twenty-six were attended by numbers of students varying from a minimum of 2 to a maximum of 291. No students presented themselves for two of the courses, Nos. v. and viii., which were quite special in their character. The lectures on General Chemistry were given in triplicate; by Professor Chandler to the students of the Schools of Applied Science, and by Professor Pellew in two distinct courses to the students of Columbia College and the students of the School of Medicine.

The number of different students from the various Schools receiving chemical instruction during the past year, was 511, but as some of these attended two or three different courses, the total attendance of the different courses aggregates 1112. The details of attendance are shown in the following tabular statements:

Courses of instruction offered by the Chemical Department, with the number of students attending each:

Course 1—General Inorganic Chemistry. 3 lectures and 1 recitation per week throughout the year. Professor Chandler, assisted by Dr. Laudy, Mr. Tucker, Mr. Whitaker and Dr. Lenher.
Students of the Schools of Applied Science....128

Course 1—General Inorganic Chemistry. 2 lectures and 1 recitation per week throughout the year. Professor Pellew, assisted by Mr. Whitaker.
Students of Columbia College................ 63

Course 2—General Inorganic Chemistry. 2 lectures per week throughout the year. Professor Pellew assisted by Mr. Whitaker.
Students of the School of Medicine...........119

Course 3—Physical Chemistry. Second-Year Course. Second half-year, 2 hours per week in lectures and recitations and 1 afternoon in the laboratory.
Dr. Morgan................................ 12

Course 4—Physical Chemistry. Fourth-Year Course. 3 hours per week in lectures and recitations during the entire year and 1 afternoon per week in the laboratory during the first half-year.
Dr. Morgan................................ 15

Course 5—Physical Chemistry. Post Graduate-Course. 2 lectures and at least 12 hours' laboratory work per week throughout the year.
Dr. Morgan.....................No applicants.

Course 6—Experimental Chemistry. Laboratory practice. 1 afternoon per week throughout the year. Professor Pellew, assisted by Mr. Whitaker.
Students of Columbia College................ 64

Course 6—Experimental Chemistry. 2 conferences and 2 afternoons of laboratory practice per week during the first half-year. Professor Pellew, assisted by Dr. Wells, Mr. Whitaker, and Dr. Lenher.
Students of Schools of Applied Science........108

Course 6—Experimental Chemistry. 2 conferences and 2 afternoons of laboratory practice per week for half the year. Half the class during the first half-year and the other half of the class during the second half-year. Professor Pellew, assisted by Dr. Vulté, Dr. Mathews, and Mr. Watters.

Students of the School of Medicine............119

Course 7—Qualitative Analysis. 1 lecture, 1 recitation, and 2 afternoons of laboratory work per week during the second half-year. Dr. Wells, assisted by Dr. Lenher and Mr. Whitaker..........................136

Course 8—The Spectroscope as Applied to Qualitative and Quantitative Analysis. Post-graduate Course. Laboratory practice and conferences with the instructor eight hours per week for either half-year. Dr. Wells, assisted by Dr. Lenher.............No applicants.

Course 9—Quantitative Analysis for Second-Year Chemists and Metallurgists. 4 hours of lectures and recitations and 15 hours of laboratory practice per week throughout the year. Professor Ricketts and Dr. Miller...................................... 20

Course 11—Quantitative Analysis for Second-Year Electrical Engineers. 15 lectures and 60 hours of laboratory practice during the first half-year. Dr. Miller and Mr. Hyde................................ 35

Course 12—Quantitative Analysis for Second-Year Mining Engineers. 2 lectures or conferences a week during the first half-year, 1 conference during the second half-year, with 15 hours of laboratory practice in alternate weeks throughout the year. Professor Ricketts, Dr. Miller, and Dr. Jouet........... 28

Course 13—Quantitative Analysis: Proximate Organic Analysis; for Third-year Chemists. 2 lectures, 2 recitations, and, for analytical and organic chemists, 16 hours per week, and industrial chemists, 10 hours per week, of laboratory practice during the second half-year. Professor Ricketts and Mr. Hyde.......10

Course 14—Quantitative Analysis: Special Methods of Commercial Analysis: for Fourth-Year Analytical Chemists and Metallurgists. 2 lectures per week throughout the year, laboratory practice for one half-year. Professor Ricketts, Dr. Miller, and Dr. Jouet... 6

Course 15—Quantitative Analysis: Post-Graduate Course in proximate organic analysis. Conferences and research laboratory work, 20 hours per week throughout the year. Professor Ricketts and Mr. Hyde. 1

Course 16—Quantitative Analysis. Post-Graduate Course in Special and New Methods. Conferences and research laboratory work, 12 hours per week throughout the year. Professor Ricketts and Dr. Miller.. 2

Course 17—Assaying; Ores and Metallurgical Products. 2 lectures and 1 recitation per week during the first half-year, with laboratory work for mining engineers 16 hours in each alternate week throughout the year; for metallurgists, analytical and organic chemists, 16 hours every week during the first half-year. Professor Ricketts, Dr. Miller, and Mr. Riederer.... 36

Course 18—Assaying; Special Methods. Post-Graduate Course. Conferences and laboratory practice at least 8 hours per week for one half-year. Professor Ricketts and Dr. Miller............................. 3

Course 20—Organic Chemistry. Elementary Course. 2 lectures and 1 recitation per week throughout the year. Mr. Bogert and Dr. Harper...................... 29

Course 30—Organic Chemistry. Elementary Laboratory Course. 8 hours per week of laboratory practice throughout the year. Mr. Bogert and Dr. Harper......... 2

Course 21—Organic Chemistry; Fourth-Year Course. During first half-year, 3 lectures, 1 recitation, and 20 hours laboratory practice for all chemists, with 2 hours conferences for students in the course in organic chemistry.

During the second half-year, 2 lectures and 1 recitation per week for students in the courses of analytical and industrial chemistry; 2 hours conferences and 16 hours laboratory work for students in the course of organic chemistry. Mr. Bogert and Dr. Harper.................................... 18

Course 22—Organic Chemistry. Minor Post-Graduate Course. Personal instruction and laboratory work not less than 12 hours per week throughout the year. Mr. Bogert and Dr. Harper........................ 1

Course 23—Organic Chemistry. Major Post-Graduate Course. Original investigation and research. Personal instruction and laboratory work. Mr. Bogert and Dr. Harper................................ 3

Course 24—Industrial Chemistry. General Course. 3 lectures, and for chemists, 1 recitation per week, throughout the year. Professor Chandler, Professor Pellew, and Dr. Laudy............................ 107

Course 25—Industrial Chemistry. Special Course. 3 lectures and 1 recitation throughout the year. Professor Chandler, Professor Pellew, and Dr. Laudy.... 22

Course 26—Industrial Chemistry. Laboratory practice : preparation of chemicals and factory processes. 3 afternoons per week during first half-year. Professor Pellew and Mr. Tucker....................... 10

Course 27—Industrial Chemistry. Laboratory practice : textile industries ; bleaching, dyeing, and calico-printing. 3 afternoons during second half-year. Professor Pellew and Mr. Tucker...................... 11

Course 28—Industrial Chemistry. Laboratory practice : water purification ; photometry ; electro-metallurgy ; fermentation, etc. 5 afternoons per week during second half-year. Professor Pellew and Mr. Tucker.................................... 2

Course 29—Industrial Chemistry. Laboratory practice : original research throughout the year. Professor Pellew and Mr. Tucker............................. 2

CHEMICAL COURSES

No.	Title of Course	Instructors	Students											
			A.B.	A.M.	Ph.D.	M.D.	E.M.	Met. E.	B.S. Chem.	C.E.	E.E.	Mech. E.	Spec.	Total
1	General Chemistry, App. Sci.	Chandler, Laudy	5	1			24		6	17	41	24	10	128
1	General Chemistry, Col. Col.	Pellew, Whitaker	58										5	63
2	General Chemistry, Col. Med.	Pellew, Whitaker				119								119
3	Physical Chemistry, 2d year	Morgan	1						10				1	12
4	Physical Chemistry, 4th year	Morgan		3	1				9				2	15
5	Physical Chemistry, Post-G.	Morgan												none
6	Experimental Chemistry	Pellew, Vulté, Wells, Whitaker, and Lenher	60			119	21		7	15	36	20	13	291
7	Qualitative Analysis	Wells, Lenher, Whitaker	4	3			25		9	23	41	25	6	136
8	The Spectroscope, Post-G.	Wells												none
9	Quantitative Analysis	Ricketts, Miller	1			1			10				8	20
11	Quantitative Analysis, E. E.	Miller, Hyde									35			35
12	Quantitative Analysis, M. E.	Ricketts, Miller, Jouet		3			23					1	1	28
13	Quantitative Analysis, Chem.	Ricketts, Hyde		1	1				6				2	10
14	Quantitative Analysis, Chem. Met.	Ricketts, Miller, Jouet		1	2			1	2					6
15	Quantitative Analysis, Post-G.	Ricketts, Hyde											1	1
16	Quantitative Analysis, Post-G.	Ricketts, Miller		1									1	2
17	Assaying, 3d year	Ricketts, Miller, Riederer		4			18		7				7	36
18	Assaying, Post-G.	Ricketts, Miller			2								1	3
20	Organic Chemistry, elementary	Bogert, Harper	5	1	1	1			13			1	7	29
30	Organic Chemistry, elem. lab.	Bogert, Harper			1								1	2
21	Organic Chemistry, 4th year	Bogert, Harper		2	1	1			13				1	18
22	Organic Chemistry, Post-G. minor	Bogert, Harper		1										1
23	Organic Chemistry, Post-G. major	Bogert, Harper			2								1	3
24	Industrial Chemistry, general	Chandler, Pellew, Laudy	15	2	1		15		11	21	21	15	6	107
25	Industrial Chemistry, special	Chandler, Pellew, Laudy		1	3				16				2	22
26	Industrial Chemistry, laboratory	Pellew, Tucker	2	1	1				6					10
27	Industrial Chemistry, laboratory	Pellew, Tucker		2					9					11
28	Industrial Chemistry, laboratory	Pellew, Tucker		2										2
29	Industrial Chemistry, laboratory	Pellew, Tucker			2									2
			151	29	18	241	126	1	134	76	174	86	76	1112

Students who attended one or more courses of chemical instruction:

COLUMBIA COLLEGE		
Freshmen	29	
Sophomores	26	
Juniors	20	
Seniors	13	
Specials	7	
		95
SCHOOLS OF APPLIED SCIENCE		
1st Class	145	
2d Class	72	
3d Class	20	
4th Class	6	
Specials	10	
Candidates for A.M	6	
Candidates for Ph.D	2	
		261
SCHOOL OF PURE SCIENCE		
Candidates for A.M	9	
Candidates for Ph.D	7	
Specials	18	
		34
School of Medicine		121
Total		511

Students who received practical instruction in the different laboratories:

General Chemistry ; Columbia College	62
General Chemistry ; Schools of Applied Science,	106
General Chemistry ; School of Medicine	119
General Chemistry Total	287
Qualitative Analysis	136
Quantitative Analysis	97
Organic Chemistry	18
Industrial Chemistry	21
Assaying	39
Physical Chemistry	27
Total	625

There has been a great increase in the number of students receiving chemical instruction, and the laboratories are, some of them, already occupied to their full capacity and even overcrowded. The Department will experience constantly increasing inconvenience from want of space, which can never be adequately met, except by the finding of accommodations for the Department of Architecture and the Department of Metallurgy in some other building, and devoting all the floors in Havemeyer Hall to this Department.

In the year 1897–98, there were 318 students receiving instruction in the different laboratories, without counting the medical students or the students of the Schools of Applied Science taking General Chemistry. The corresponding number for the past year was 400, while, adding the students in the Schools of Applied Science taking General Chemistry, and the students in Medicine, there were in all, during the past year, 625 students at work in the different laboratories.

Valuable contributions to the Museum have been received during the past year, which have been reported elsewhere. The appropriation of the year was not sufficient to meet the requirements, and different members of the Chemical Staff have contributed for different purposes sums of money as follows:

Attendant for the Chemical Library, twelve weeks,	$ 96 00
Boy in the Quantitative Laboratory.............	121 60
Apparatus and Chemicals for the laboratories.....	851 95
Total.................................	$1069 55

In conclusion, it should be said that the work in the different laboratories has been extremely satisfactory, and the number of post-graduate students studying for the higher degrees is constantly increasing, there having been 15 students pursuing courses for Master of Arts, and 9 students pursuing courses for Doctor of Philosophy. Many of these students were engaged in original investigations which have resulted in valuable contributions to chemical science, and which have, some of them, been already published in scientific journals.

Researches

The Determination of Sulphur in Asphalt, E. H. Hodgson, B.S., *Jour. Am. Chem. Soc.*, xx, Nov., 1898, 882, *Chem. News*, March 10, 1899.

Preparation of Metallic Tellurium, Victor Lenher, Ph.D., *Jour. Am. Chem. Soc.*, xxi, April, 1899, 347.

Tests for Boric Acid, Victor Lenher, Ph.D., and J. S. C. Wells, Ph.D., *Jour. Am. Chem. Soc.*, xxi, May, 1899, 417.

A Method for the Analysis of Canned Condensed Milk, F. S. Hyde, Ph.B., *Jour. Am. Chem. Soc.*, xxi, May, 1899, 439.

The Theory of the Formation of Nickel Sulphid, J. Livingston R. Morgan, Ph.D., and A. H. Gotthelf, Ph.B., *Jour. Am. Chem. Soc.*, xxi, June, 1899, 494.

The Theory of the Separation of Barium, Struotium, and Calcium from the mixed Sulphates, J. Livingston R. Morgan, Ph.D., *Jour. Am. Chem. Soc.*, xxi, July, 1899, 522.

Investigations of Magnetic Iron Ores from Eastern Ontario, F. J. Pope, Ph.D., *Trans. Am. Inst. Min. Engs.*, 1899.

Preparation of Graphitoidal Silicon, F. S. Hyde, Ph.B., *Jour. Am. Chem. Soc.*, xxi, Aug., 1899, 663.

Classification of the Carbides, the Modes of Formation, and Reactions of Decomposition, J. A. Mathews, Ph.D., *Jour. Am. Chem. Soc.*, xxi, Aug., 1899, 647.

On the Separation and Determination of Arsenic and Antimony in Ores, O. C. Beck, B.S., and H. Fisher, B.S., *School of Mines Quarterly*, July, 1899.

The Purification of Drinking-water by the use of Ozone, G. A. Soper, B.S., M.A., Thesis for Ph.D.

Electrolytic Cells for Rectifying Alternating Currents, Thesis for Ph.D., W. L. Hildburgh.

The Use of Aluminium and Chromium in Ratification Cells, Thesis for A.M., W. A. Duff.

Theoretical Work upon the Preparation of Potassium Percarbonate, Thesis for B.S., R. E. Heike.

The Specific Gravity and the Electrical Conductivity of Pure Metallic Tellurium, J. L. R. Morgan, Ph.D., and V. Lenher, Ph.D.

During the past year the Chemical Society of Columbia University was organized, among the students and officers of the Chemical Department. Sixteen public meetings were held, at which twenty-eight chemical papers were read, sixteen prepared by students and twelve by officers. Seven lectures were also given before the Chemical Society, which were open to the public and well attended.

It is to be regretted that it has not yet been possible to organize a special course in Chemical Engineering for the purpose of preparing chemists to act as superintendents and managers of large chemical works, dyeing and calico-printing establishments, etc., where a knowledge of machinery is quite as important as a knowledge of chemistry. Courses in Chemical Engineering have already been established in several American institutions. The knowledge of mechanical engineering obtained by pursuing such a course gives the chemist an opportunity to occupy a much more important position in chemical works than that of a mere analyst.

DEPARTMENT OF GEOLOGY

The personnel of the Department of Geology has remained unchanged.

The transfer of the course in General Geology (Geology 2) from the third year to the second year of the course in Mining Engineering has now been consummated, and the work is in successful operation. Both the third- and fourth-year classes took Economic Geology (Geology 3) together the past year, but hereafter it will be given to the third-year students alone. The geological option in the fourth year of the School of Mines will first become operative in 1899–1900. In accordance with the above arrangements, three lectures weekly with occasional conferences have been given in Geology 2, to students of the courses in Mining Engineering, Metallurgy, and to third-year students in Civil Engineering. Three lectures weekly upon Economic Geology have been delivered to third- and fourth-year students in Mining Engineering and Metallurgy.

The work of the Summer School in Geology was performed under the guidance of Professor Kemp during the first week in July in the valley of the James River, Va.

Beginning on the east about four miles east of Balcony Falls we traversed the ledges and eroded folds to Covington. We visited the Natural Bridge and the Low Moor Iron Mines, and altogether had a most instructive and interesting session. The section embraced formations from the ancient crystallines well up into the Devonian.

The usual course in Petrography (Geology 4) was given in the spring term to second-year students in Mining Engineering.

The facilities of the new site have enabled us to perform the work with much greater ease and efficiency than ever before and with added thoroughness.

DEPARTMENT OF CIVIL ENGINEERING

Mr. Earl B. Lovell, C.E., appointed Adjunct Professor in Civil Engineering a year ago, began the active discharge of his duties on July 1, 1898, and he has continued to discharge them ever since in the most satisfactory manner· He took immediate charge of the Summer School of Surveying, near Morris, Conn., during the session of 1898, assisted by Mr. A. Black, Tutor in Civil Engineering, Mr. Charles Derleth, Jr., Assistant in Civil Engineering, and three other special assistants. The entire work of the Summer School was performed very efficiently, while the railway survey was brought to a materially higher degree of excellence than heretofore.

The general lecture, design, and problem work of the department has been extended in several directions, particularly in graphic statics and railroad engineering. A somewhat more extended course in the laboratory work in cement testing has also been attained during the year now closing. In accordance with the action of the Faculty about one year ago, the testing of materials coördinate with the lecture work in the subject of Resistance of Materials has been performed by this department with the members of its own force. This has resulted in distinct advantage by securing more complete unity in the results of the lecture and laboratory work in that subject.

Early last autumn this department completed plans for the hydraulic laboratory which is to form a portion of the Henry R. Worthington laboratory. It was not until March that the work of elaborating and working plans preparatory to construction was taken up by Mr. Charles C. Worthington, President of the Henry R. Worthington Company. It is believed that the laboratory will be completed and installed ready for use during the first session of the next academic year.

Through the generous efforts of Mr. Louis Rosenfeld the sum of $500 has been presented to the department by a number of gentlemen for the purpose of installing a laboratory for the testing of road materials. The principal pieces of apparatus are now being constructed, and the laboratory will be installed during the coming summer.

The general standard of excellence hitherto reached has at least been maintained in all subjects of the department, and in a number of them distinct advances have been made, and the satisfactory conditions now existing give substantial promise of continued progress.

DEPARTMENT OF ELECTRICAL ENGINEERING

The elementary course in Electrical Engineering (Electrical Engineering 7) included for the first time the students in the Mechanical and Civil Engineering courses. This course leads up to the more advanced technical work of the third year.

It is desirable that the second term of the fourth year be relieved of some of the studies pursued during this period. During the last year Thermodynamics (Mechanics 4) has been transferred from the first to the second term. Besides this, there has been established a new course in Metallurgy (Metallurgy 3), also given in this second term. It has been found that the Senior students are much hampered in the pursuit of their thesis work and the laboratory exercises by the presence of these two three-hour courses. It would be well to consider the transference of one or both of these subjects to the first term of this year.

Owing to Professor Crocker's absence on leave during this academic year, his lectures to the fourth-year Electrical Engineers and those to the third-year Civil and Mining Engineers have been delivered by Professor W. A. Anthony, who was called to the University as a lecturer. The Department wishes to express its appreciation of the manner in which Professor Anthony's difficult task has been accomplished, and feels grateful for the interest in and the suggestions made concerning the conduct of the Department's courses.

The courses which he delivered were as follows: Electric Power (Electrical Engineering 2); Electro-Chemistry and Electro-Metallurgy (Electrical Engineering 3); Management of Electrical Plants (Electrical Engineering 22); Electrical Distribution (Electrical Engineering 23), these being fourth-year subjects; and Electrical Engineering (Electrical Engineering 5) to the third-year Civil and Mining Engineers.

Mr. Sever has delivered all the lectures in the course on Dynamo and Motor Practice (Electrical Engineering 1) during the academic year, thereby taking the lectures in this course usually delivered by Professor Crocker.

Mr. F. Townsend has been regularly appointed as an assistant in the Department.

The laboratory work in connection with Electrical Engineering 5 has been carefully arranged and systematized in order to meet the needs of the students in this course. A set of mimeograph notes has been developed for the purposes of instruction in this subject, and the instruction is carried out from a purely engineering point of view. Only those matters which such engineering students as pursue this course are liable to come in contact with in their professional life are brought to their attention.

The fourth-year Electrical Engineering laboratory work, both in the instrumental and alternating-current laboratories, has been developed by Mr. Freedman and Mr. Townsend to a much larger extent than has been possible in past years. This has been due both to the increased floor space available, as well as to the acquisition of apparatus with which to demonstrate the principles.

For the purpose of class-room instruction there have been compiled 150 diagrams made on heavy Manila paper, 30″ × 36″, these illustrating typical designs of apparatus and the connections of electrical circuits according to standard practice.

The following gifts have been received by the Department during the year:

From the General Electric Co., eleven transformers of various capacities.

From the Lakon Company, one transformer.

From the Beacon Lamp Co., a large collection of incandescent-lamp material illustrating the processes in the construction of this type of lamp.

From the Brooklyn Edison Electric Illuminating Co., two large storage-battery plates as used in their storage-battery equipment.

The announcement circular, issued April 17th, has been made more complete in its scope by the addition of a tabulated "Schedule of Topics," the function of this being to indicate to the student, as well as to others, the details of the subjects contained in the four-year course in Electrical Engineering. The use of this table saves much time in arranging a course of study.

Mr. Freedman is writing a serial article in the *School of Mines Quarterly* entitled "Telegraphy and Telephony," this being based upon notes used in delivering his course in Electrical Engineering 6 on the subjects indicated above. This article will eventually be published in book form and will provide an excellent and very necessary text-book for his course.

During the year the following visits of inspection have been carried out:

In the early autumn the fourth-year class in Electrical Engineering, accompanied by members of the teaching staff, visited the factories of the Crocker-Wheeler Co. at Ampere, N. J., every opportunity being afforded the party for closely inspecting the various processes of manufacture.

On February 9th and 10th a party of twenty-six men, composed of members of the fourth-year class and instructors, visited the factories of the General Electric Co. at Schenectady, N. Y., where two days were spent in making a careful tour of the various factories. Every opportunity was afforded the party for gathering information concerning the many interesting processes and machines. On the following day a visit was made to the water-power plant at Mechanicsville, N. Y., whence power is transmitted to Schenectady, twenty miles away, at a pressure of twelve thousand volts. The party returned by way of Albany,. inspecting the Capitol Building while there. This was a most successful and instructive trip, and could be undertaken as a yearly feature of the Department's work.

On April 15th a party of fourth-year students and members of the teaching staff visited the works of the Guggenheim Smelting Co. at Perth Amboy, N. J. The copper, gold, silver, and lead refining processes were in operation and were carefully studied.

On May 6th a party visited the mine of the New Jersey Zinc Co. at Franklin, N. J., in order to observe the operation of the magnetic ore-separators in use at that place. These operate to remove the iron from the zinc ore.

The needs of the Department in the matter of equipment for its laboratories are very pressing, and this is especially noticeable in the alternating-current laboratory. On account of the recent enormous developments in alternating-current engineering many important and vital problems have arisen which require the use of modern apparatus for their study. The proper study of the complicated principles and actions involved requires, in many instances, the possession of duplicate apparatus. It is urged that steps be taken to provide the necessary equipment in the matter of machines and instruments for this most important branch of the laboratory work.

The direct-current laboratory is also in need of much new equipment, but as there have been no recent developments of importance in this line of electrical engineering, this part of the laboratory system can afford to wait until the more imperative necessities of the alternating-current laboratory are provided for.

In the matter of personnel it is urged that provision be made for a larger force of assistants for the laboratory instruction. This section of the Department is of paramount importance, and being used by such a large number of men in the various courses (electrical, mechanical, civil, and mining), it has been found extremely arduous for the present force to handle the instruction in a manner which will afford the most successful results.

It is recommended that two assistants be appointed for the purposes of carrying on the laboratory instruction.

DEPARTMENT OF MECHANICAL ENGINEERING

Class-room exercises have included courses of lectures, by Professor Hutton, on heat and heat engines, on water motors and such as use other media than steam, to the entire fourth class. The first two courses have been accompanied with manifold notes, which were used as a basis for recitation in connection with the lectures. In the exercises upon the Engineering of Power Plants, Steam-Engines, and Steam-Boilers, Professor Hutton's text-book, *Mechanical Engineering of Power Plants*, has been used, with explanatory lecture material and abundant use of the projection lantern, in the second, third, and fourth years. Instructor Woolson has given courses in mechanism and transmissive machinery, and has extended the work in properties of materials for the Mechanical and Electrical Engineers. Instructor Mayer has conducted the class-room work, as well as the drawing-room exercises in descriptive geometry, graphics, shades, shadows, perspective, and other courses pertaining to successful draughtsmanship. The instruction in the locomotive engine has been conducted by Professor Hutton for the Civil Engineers in the first term of their fourth year.

The work in the drawing-rooms has been most satisfactory and excellent. The detail has been conducted by Instructor R. E. Mayer and Assistant S. O. Miller. Should the classes continue to grow in size in the near future it will be necessary to make some arrangement whereby additional accommodation can be secured for students in the drawing-rooms.

The work in the testing laboratory has been conducted this year for the students in Civil, Mining, and Electrical Engineering under the guidance of Adjunct Professor Lovell, of the Department of Civil Engineering. This assignment was made pursuant to a policy inaugurated in 1898, whereby the work in testing materials was so divided that the department giving instruction in resistance of materials should also conduct in the laboratory of the Mechanical Engineering Department the instruction in manipulation of the testing machines. The students were divided into small groups, and their work has included testing of timber, brick, cast iron, wrought iron, and steel.

The conditions of the University upon its financial side have stood in the way of completing the mechanical laboratories for the use of advanced students in Engineering. The effort of the Department has been to get the laboratories ready for the use of the third-year Mechanical Engineers in the autumn of 1899. Hence there has been no use made this year of the Worthington Hydraulic Laboratory, and the equipment of the Allis Laboratory has been regrettably delayed all through the winter. The Ingersoll-Sergeant Air Compressor has been erected and connected to the pipe system of the laboratory, and has been operated experimentally during the spring.

The great interest of the year has centred about the installation of the Baldwin compound locomotive in the western section of the laboratory. A considerable excavation was made during the summer of 1898 to receive the supporting wheels with their bearings below the floor level, and during the autumn the bumper-post and the two sections of track were procured and laid. For the bumper-post the Department is indebted to the Mechanical Manufacturing Company of Chicago; for the rails of the track, to the Pennsylvania Steel Company, through the kindness of Mr. E. C. Felton, President, and Mr. Stephen W. Baldwin, their

New York representative; for the ties and the skill necessary to lay the rails, the Department is indebted to the Maintenance of Way Department of the New York Central Railroad, through Mr. Van Etten, General Superintendent. Mention should also be made of the kindness of the Carnegie Iron and Steel Company in the gift of certain steel beams required in the installation of the supporting structure.

The expenses connected with the fundamental installation were borne out of a special fund contributed by Messrs. Robt. Schell, F. A. Schermerhorn, John Stanton, Sumner Hollingsworth, and Alfred Liebmann. The supporting wheels, with their axles, were purchased from the Baldwin Locomotive Works, and the great bearings from the George V. Cresson Company of Philadelphia. The locomotive was delivered early in January, and the operation of erecting it, in the absence of the usual special machinery for this purpose, occupied over six weeks. The Baldwin Locomotive Works sent expert painters from their shops to decorate the engine upon the completion of its installation. By this time the fund for installation had been exhausted, and it was impossible at once to complete the provision required for disposing of steam and products of combustion from the engine stack, or to attach to the supporting shafts the dynamometers required to furnish an adequate resistance so as to make the engine a piece of scientific apparatus. It was at once decided, therefore, to connect the engine to the small air compressor, so as to operate it with compressed air, in order to see whether its working was satisfactory. On the 28th of April the throttle-valve was opened for the first time, and the engine was slowly run with air during many days previous to the end of the term.

It is gratifying to state that the generous interest of friends has made it possible to order the desired resistance dynamometers and that it is probable that provision both for disposing of the products of combustion and for running the engine with its own steam will be completed in the early autumn of 1899.

It has not been found possible to find a proper location for the gas engines, hot-air engines, and group of small steam-engines where they can be permanently installed, so that for the present this part of the mechanical equipment is located on the floor of the power house.

The Allis engine and the Dodge memorial have been promised for the early autumn of 1899. The Department has been compelled to make considerable expenditure in the laboratory for the connection of the large machines with the necessary steam and exhaust piping. The connection of many of the machines with the water reservoirs is not yet completed. For this reason there has been no increase to the apparatus of the Department by purchase during the year.

The section of laboratory equipment devoted to study and practice in workshops has been in operation for all students of Engineering at the University. The shop devoted to wood-working and pattern-making has been under the charge of Instructor Edwin B. Finch of the Teachers College staff, and the work has been most effective and satisfactory. For the Mechanical Engineering students, the equivalent of two afternoons a week, of two and one half hours each, have been devoted to work at the bench in joinery and framing, for the first term; in wood-turning and pattern-making, for the second term. The Summer School, devoting a period which is the equivalent of 100 hours, in the month of June, to pattern-making, moulding work, and foundry work, will bring the student to the objective point of the entire first-year course, which is the familiarizing of the young engineer with the conditions which must be met in the design of structures to be realized in cast iron. The students in Electrical and Civil Engineering have had the equivalent of one afternoon period of two and one half hours per week and have pursued a selected course chosen from the more extended course of the Mechanical Engineers. In the second year, for the Electrical and Mechanical Engineers the course in the metal-working department has been conducted by Instructor Chas. P. Benns of the Teachers College staff. It has given to the

Electrical Engineers one afternoon period of two and one half hours per week, in the first term devoted to forging and bench or vise work, and the same period in the second term to work at the machine tools, with planer, lathe, milling machine, etc.; and to the Mechanical Engineers have been given four such periods. The experiment was tried this year of consolidating the work in the shops into consecutive days, and it has worked with great efficiency. It has been found, however, that the increasing numbers of students will make it impossible to continue this plan, and, furthermore, it resulted in inconvenience in certain other departments. The gain in efficiency, however, was most marked.

The additions to the equipment and facilities of the Department this year, outside of those which are covered in the previous paragraphs, have been:

From the Dake Engine Company a five-horse-power reversing square piston engine; from Dr. T. Ludlow Chrystie a five-horse-power Baxter combined steam-engine and boiler; from the Continental Iron Works three massive floor-plate castings for the erection of experimental machinery, and from the De La Vergne Machine Company the labor required to plane them and finish them to the desired form. The Henry R. Worthington Company have supplemented their previous gift by the addition of the massive air-chamber which is to serve as a stand-pipe for the hydraulic laboratory. This has special interest by reason of the fact that the upper part is a welded steel forging all in one piece and without joint or seam. The American Impulse Wheel Company have presented one of their small water motors and the Abner Doble Company of San Francisco have promised a gift of a similar machine of their design. The testing laboratory's equipment has been increased by the gift from Mr. Bishop of an electric appliance for measuring the deformation of short specimens undergoing compression. This gift is an incident to a most interesting investigation which has been in progress during the year as to the resistant qualities of jade. A form of pump specially adapted for the Emery Testing Machine has also been secured by purchase. By reason of the development in other sections of the Department there has been less available for the increase of its collection of lantern slides and similar illustrative material. The addition this year has been small.

The vacation class in Mechanical Engineering has included this year a three days' trip to the works of the Bethlehem Iron and Steel Company, Bethlehem, Pa.

The advantage of more convenient arrangement of the Department with respect to the convenient exhibition of its collections in museums and in the drawing-rooms, has made itself felt in an increased efficiency of instruction along all lines.

DEPARTMENT OF MATHEMATICS

The Educational Staff of the Department, the University courses of instruction given and the attendance at each, the work of the Fellow or Fellows, researches and publications of the Department, miscellaneous items of interest, and the number of collegiate and other courses, not herein referred to, given during the year, have all been stated in the report of the Department to the Dean of the Faculty of Pure Science.

The students of the first class in all of the Schools except the School of Architecture, subdivided into three sections, have been taught by Mr. Maclay, Dr. Chittenden, and Mr. Keyser. Each section attended five hours a week, and the subjects taught were trigonometry, analytical and spherical; mensuration of surfaces and volumes; so much of algebra as is not required for admission; and the whole of analytical geometry.

The students of the second class in all the Schools except the School of Architecture, subdivided into two sections, each attending three hours a week, have been taught differential and integral calculus by Prof. Van Amringe.

The several courses in Mathematics, as set forth in the Announcement, have been accomplished.

DEPARTMENT OF MECHANICS

The courses of instruction given during the past year, the instructors conducting them, and the number of students attending each course are given below:

Course 1.—Analytical Mechanics, three hours per week throughout the year, by Professor Woodward; 53 students.

Course 3.—Theoretical Mechanics, two hours per week throughout the year, by Mr. Pfister; 4 students.

Course 4.—Thermodynamics, three hours per week during the second half-year, by Professor Pupin; 44 students.

Course 5.—Elementary Thermodynamics, two hours per week during the first half-year, by Mr. Pfister; 10 students.

Courses 6, 7.—Theory of Dynamo and Motor, three hours per week throughout the year, by Professor Pupin; 27 students.

Course 8.—Theory of Alternators and Transformers, three hours per week during the first half-year, by Professor Pupin; 24 students.

Course 9.—Theory of Variable Currents, three hours per week during the second half-year, by Professor Pupin; 24 students.

On the whole, the work of the Department during the past academic year has gone on quite satisfactorily. The regularity of attendance of the members of classes has shown an improvement over previous years, and the grade of scholarship attained in the various courses appears to be fully up to the average. To this generally satisfactory status of the year's work, however, an exception may be noted. Course 4 in Thermodynamics, which has been given previously to fourth-year students during the first half-year, was given this year during the second half. This change in the time of presenting the course does not seem to be well justified. Professor Pupin, who has conducted this course, says: " I find that the students do not take to it as readily as they did when the subject was taught during the first half-year, and I explain this by the fact that it is somewhat too late to bring a purely theoretical and entirely new subject before students during the last term of their academic career."

DEPARTMENT OF METALLURGY

(1) *Departmental Library.* The gift of nearly a thousand standard books and periodicals recently presented by Professor Thomas Egleston has been received. This very valuable acquisition includes the following periodicals: *Journal of the Iron and Steel Institute*, complete from 1871 to date; *Annales des Mines*, from 1832 to date; *Revue Universelle des Mines*, from 1857 to date; *School of Mines Quarterly*, complete; *Engineering and Mining Journal*, from 1872 to date; *Transactions American Society of Mechanical Engineers*, complete; *Stahl und Eisen*, complete from 1881 to date; *Berg- und Hüttenmännisch Zeitung*, from 1860 to date; *Wagner's Jahresbericht der Chem. Technologie*, complete to date. These works, together with those originally set aside from the main library, now constitute a collection of works on metallurgy and allied subjects which may be considered as one of the best working metallurgical libraries extant.

The books are properly catalogued and arranged in one of the rooms of the Department, with tables for the use and comfort of the students.

Weekly and monthly publications covering American, English, German, and French practice metallurgical are on file and afford excellent means of keeping the literature of the subject fully up to date.

Students attending the lectures on Metallurgy may be permitted to take out books over night, to be returned on the following morning; in this way the value of the library for reference is in no way impaired.

(2) *Furnace-Room Equipment.* The gift of a separate fund from an anonymous friend has enabled the Department to make a fair start with the equipment of the furnace-room, and several furnaces and primary pieces of apparatus have been purchased and put in place.

The following furnaces are now installed and in use:

A. A large down-draft crucible furnace which will contain a No. 40 graphite crucible of a capacity of 80 pounds of iron or steel, and a specially designed crane to handle the large crucible.

This furnace has given us excellent results as to high temperature attained and ease of control.

B. A large oven furnace, with a hearth 18″ × 24″ in area, suitably connected by overhead pipe to the chimney flue.

This excellent furnace affords ready means for pursuing investigation on the heat treatment of metals and on roasting ores in small amounts.

This furnace has proven of good value for student and department use.

C. A set of leaching barrels and tubs has been arranged in terraced framework for experimental work on leaching gold and silver ores by the wet processes, such as the Russell or cyanide processes. This small experimental plant is adapted for copper ores or other material to be treated by wet methods.

D. A work-bench with ordinary tools for repairs and construction of simple apparatus has been set in place and furnishes the Department with ready means for setting up new arrangements of apparatus without delay.

E. Necessary accessions to the microscope for the examination of metals, including a photo-micrographic outfit.

F. A drill for taking metal samples.

G. The electric furnace has been contracted for, and is building.

H. The gas-fired regenerative furnace, operating with natural draft, fully described in the *School of Mines Quarterly*, xv, No. 2, p. 138, January, 1894, has been set in place and is ready for special work.

I. The gas-fired furnace procured for the Committee on Tests by Mr. Henning is in place and has proven of value to the Department, as it will heat up, with fair uniformity of temperature, a bar of metal 28 inches long.

J. The Department now has two Le Chatelier thermo-electric pyrometers installed in the furnace-room, with necessary switches, pole changers, and connections.

K. Work of special value has during the year been carried on in this furnace-room by students in post-graduate and undergraduate courses, as well as by the Department, and this branch of the Department will doubtless prove of growing attraction for special and graduate students.

The present installation, while excellent as far as it goes, is inadequate for the demands which may be reasonably expected within a year or two. There is a large field for research work which could be tilled profitably in this room, and, as the courses develop, much new material will be required.

Let us hope that some one, whether graduate of the School of Mines or not, will be sufficiently interested in the development of science to help us equip this important branch of the Department in a satisfactory manner.

(3) *Special Investigations.* The following investigations have been carried on in the Department furnace-room and laboratory:

R. G. Morse and C. H. Eckerson have determined the influence of heat treatment on the tensile properties and microstructure of steel by exposing a large number of steel bars for varying lengths of time to various temperatures, reaching in some cases 1300° C. They have determined the tensile strength and other properties of the bars after slow cooling, and have also examined and photographed the structure with a microscope.

O. R. Foster has determined the relative desulphurizing power of lime and magnesia by melting one and the same cast-iron in carbon crucibles with several sets of slags, each set consisting of two slags alike save that one was relatively rich in magnesia and the other relatively rich in lime. He has then ascertained, by analyzing the iron, whether the more magnesian or the more calcareous was the more effective in removing sulphur.

E. W. Scherr, Jr., has examined the influence of an addition of carbon on the removal of arsenic in the roasting of copper ores, by roasting two samples side by side in the same furnace, to one of which he added charcoal. Samples were taken at brief intervals, and the analysis of these samples showed the rate of expulsion of arsenic in the two cases.

For each of the foregoing a thesis has been submitted and has been approved.

H. A. Loos has begun an investigation into the addition of arsenic and antimony in copper in the various stages of refining by mixing arsenic or antimony, or an oxide of one of them, as the case might be, with tough pitch copper in the different stages, and then overpoling it. An analysis and microscopical examination is expected to show the condition of the arsenic or antimony in the overpoled copper.

"The Relation between the Electrical Conductivity, the Viscosity, and the Composition of Silicates." "The Melting Point of Cast-iron for the Basic Bessemer Process."

(4) *Lectures.* During January, 1899, Professor Howe delivered a new shortened course on iron and steel for the students in the School of Mines and in the School of Chemistry. The special feature of the short course is to provide the students with a knowledge of the subject as pertains mainly to those physical properties of iron and steel which are of such great value to the engineer from a constructional standpoint. A brief outline of the course is:

Course 2. The Metallurgy of Steel and Iron—The properties of steel, cast-iron, and wrought iron, as influenced by composition and by thermal and mechanical treatment, together with a brief account of the chief process by which they are made. 3 hours a week during January. Professor HOWE.

Required of third-year students in the Schools of Mines and Chemistry.

A new long course on iron and steel was delivered by Professor Howe during the second term to the students in the courses of Civil, Electrical, and Mechanical Engineering. Briefly outlined, the course consists of:

Course 3. The Metallurgy of Iron and Steel—Ores: Classification and constitution of iron and steel; the blast furnace; composition and properties of cast-iron; composition of wrought iron and steel, and the influence of thermal and mechanical treatment; puddling; the Bessemer, open-hearth, and crucible processes; forging and rolling; casting cast-iron and steel; and the minor processes of steel and iron making. 3 hours lectures a week, second half-year. Professor HOWE.

Required of third-year students in the course of Metallurgy and Mechanical Engineering, and of fourth-year students in the courses of Civil Engineering and Electrical Engineering. Students in the course of Metallurgy have an additional hour per week.

Course 6. Practical Laboratory Work—The new course in practical laboratory work, Course 6, was organized and started this year. This course was designed to furnish students with special training not ordinarily obtainable in laboratories. It consists of experimental tests covering metallurgy in general.

The course as carried out this year consisted of the following experiments:

Refractory Materials

(1) The reaction between basic and acid refractory materials under the conditions of heat and mechanical contact.

(2) The shrinkage and fusibility of the common refractory materials.

(3) The macro-structure of graphite crucibles, showing the advantage of hand moulding over machine-made crucibles.

(4) Tests illustrating the fact that the clay used in the manufacture of graphite crucibles is selected for its binding property and not for its refractoriness.

Heat Treatment of Metals

(5) Tests showing the temperatures in which steel possesses hardening power, and the relation of the hardening power to the magnetic properties.

(6) Tests showing that the hardening power is a function of carbon contents.

(7) Tests showing the effect of tempering steels that have been hardened by quenching.

(8) Tests showing the modification of the effects of cold working by tempering.

(9) Brinell's tests on the effect of heat treatment on the size of the grain in steel.

Fluxes and Slags

(10) Tests showing the relative fusibilities of mono- and bi-silicates of lime and the effect of adding five per cent. of calcium fluoride (fluor spar) to each of these silicates.

(11) Tests showing the effect of having two bases instead of one in a silicate of given oxygen ratio.

(12) Tests showing the effect of adding ten per cent. of ferrous oxide to a mono-silicate of lime and to a bi-silicate of lime.

Fuels

(13) Calorimetric tests of the value of fuels as ascertained by the Mahler Bomb Calorimeter.

Gas Analysis

(14) Analyses of furnace gases by the Orsat Gas Apparatus.

Pyrometry

(15) Calibration of the Chatelier thermo-electric pyrometer.

Section Cutting

(16) Cutting, grinding, polishing, and etching metal sections for microscopic study.

Microscopy and Microphotography.

(17) Magnification, field illumination, and preparation of a large number of micro-photographs.

Ore Roasting

(18) Tests showing the oxidation and elimination of sulphur during the ordinary roasting of a sulphide copper ore.

It is the intention to amplify the subject-matter of this course so as to offer special attraction for general experimental work that cannot be readily accomplished in ordinary laboratories.

Such modifications in the course may be made to suit the requirements of special students, giving particular stress to that branch of metallurgy which the student expects to follow.

Metallurgical Excursions.

During the year Saturday excursions were made by the students attending the lectures in Metallurgy to the following establishments :

(1) Nichols Chemical Co. at Laurel Hill, N. Y., for the study of copper smelting, Bessemerizing matte, and furnace refining of copper.

(2) Guggenheim Smelting and Refining Co. near Perth Amboy,

N. J., for the study of lead desilverizing and refining, electrolytic copper refining, electrolytic separation of gold and silver, and furnace refining of copper.

(3) J. L. Mott Iron Works, New York City, for the study of special foundry practice and enamelling process.

(4) Atha and Illingsworth Co. at Harrison, N. J., for special steel practice in rolling, forging, etc.

(5) West Bergen Steel Works, N. J., for the study of crucible steel manufacture and special treatment of steel by annealing, cold drawing, rolling, etc.

The Summer School for 1898 consisted of a two-weeks' visit to the chief iron and steel works of Pittsburg, and to those at Johnstown, Latrobe, Pencoyd, Phœnixville, and Steelton, Pa., where the students saw and took notes on the most advanced practice in the world.

(5) *The Collection.* The re-arrangement of the Metallurgical Museum, begun last year, has been finished, and the mass of accumulated material has been divided into two parts; the especially instructive or interesting specimens are arranged systematically in the cases on the main floor of Havemeyer 103, and the rest, duplicates, and specimens valuable only for purposes of reference or for investigation, are arranged in the gallery. Almost every specimen in the former part has been relabelled very legibly, and a very large number of valuable gifts have been sought and have been received. In addition, many important specimens have been specially prepared in the Department.

The Department has secured, by purchase and gift, considerable stock material for use in the laboratory courses—suites of steels of required varying composition, copper ores and mattes, rich and poor in silver and gold, ingot copper, acid and basic refractory materials, etc.

(6) *Gifts.* The more important gifts of recent date to the Department are outlined below, and we take this opportunity of expressing publicly our appreciation and thanks to the kind donors:

Samples of lead and copper matte from Argentine, Kas., from W. A. Smith, Jr.

A suite of fifty lantern slides illustrating the physical constitution of steels and irons, from Mr. J. E. Stead, of Middlesborough, Eng.

A suite of specimens illustrating the heat treatment of iron and steel, from Mr. J. A. Brinell, of Fagersta, Sweden.

A suite illustrating the reduction of aluminum, from the Pittsburg Reduction Company.

A suite of a large number of nickel and chromium steel specimens with analyses, especially selected for lecture illustration and for investigation work, from W. B. Kunhardt, E.M., of the Carpenter Steel Company.

A number of ferro alloys, from O. M. Hartzell Company, Pittsburg, Penn.

Crystals of iron, from Mr. P. Kreuzpointner.

A large suite of special steels with analyses, from Mr. R. E. Jennings, Jersey City, N. J.

A large number of samples of pig-iron and slags of the Illinois Steel Company, from B. Stoughten.

An iron casting with charred lace for a pattern, from A. E. Outerbridge.

A large drawing of the Taylor Gas Producer, from R. D. Wood & Co., Philadelphia.

A wire-drawing machine, from the Roebling Co., of Trenton, N. J.

Micro-sections of steel, from F. Osmond, Paris.

A number of ferro alloys with manganese, silicon, tungsten, chromium, etc., from George G. Blackwell, Sons & Co., Liverpool, England.

Cast-iron samples, from the Columbus Machine Co., Columbus, Ohio.

Parts of open-hearth furnace linings, Mr. Talbot, Pencoyd, Pa.

Charcoal pig-iron and slags of Canada Iron Furnace Co., E. Guilford Smith.

Special rolled sections, Robert E. Jennings.

Two specimens of bronze, Manusel White.

Two specimens of mond nickel, H. A. Loos.

Steel test bars, showing fractures, I. H. Woolson.

Mesabi ores, J. F. Kemp.

Copper ingots, overpoled, set, and tough pitch, Nichols Chemical Company, New York.

Hollow steel billiard ball, Mitis Steel Co., Stockholm.
Special cast-iron medal, Kichiym Foundry, Russia.
Welded chrome steel and iron plate, Chrome Steel Company.

(7) *Publications.* By Professor Henry M. Howe:

- The Hardening Power of Low-carbon Steel. *The Metallographist*, July, 1898, i, 259–265.
- The Magnetic Transformation and Hardening of Steel. *The Metallographist*, July, 1898, i, 270.
- The Allotropic Theory and the Hardening Power of Low-carbon Steel. *The Metallographist*, January, 1899, ii, 77–78.
- The Structure of Steel. *The Metallographist*, April, 1899, ii, 165–168.
- Metallurgical Laboratories. *Trans. Amer. Inst. Min. Eng.*, xxix.
- Progress in Iron and Steel Metallurgy in 1898. *The Mineral Industry*, vii, The Scientific Publishing Co.

By Jos. Struthers, Ph.D.:

- Metallurgical note and abstract references for the year 1898. *School of Mines Quarterly*, April, 1899, xx, No. 3.
- Review of "Mineral Industry" for 1897. R. P. Rothwell. *School of Mines Quarterly*, Nov., 1898, xx, No. 1.
- Review of "Metallurgy of Lead," sixth edition. H. O. Hofman. *School of Mines Quarterly*, April, 1899, xx, No. 3.
- Review of "Handbook of Metallurgy." C. H. Schnabel, translated by Henry Louis. *Science*, April 21, 1899, ix, No. 225; and *School of Mines Quarterly*, April, 1899, xx, No. 3.

In preparation, A Handbook of Electro-metallurgy.

DEPARTMENT OF MINERALOGY

The courses of instruction as set forth in the circular of information have been given. Course VIII, having been transferred from the first term of the fourth year to the second term of the third year, was given twice.

The marked increase in the number of students taking the courses under the Faculty of Applied Science, which was shown in the report of last year, has been maintained, and there is a further increase in each course, as shown in the following tabulation :

Course	Students Attending		
	1896–97	1897–98	1898–99
I. Blowpipe Analysis	22	34	40
II. Crystallography	22	34	41
IV. Mineralogy :			
First Class	22	32	35
Second Class	24	23	29
V. Minerals of Building Stones	16	18	20
VI. Optical Mineralogy	15	15	22
VIII. Physical Crystallography	0	2	3

The economic collection has been very materially improved by the substitution of a large number of specimens from the Egleston collection, and is now, in grade of specimen, little inferior to the Systematic collection.

The annular space under the large lecture-room, which was assigned to the Department and equipped for microscopic work, proved too dark, and the work has this year been done at tables built in the windows of the Mineralogical Museum.

The continued increase in the number of students has forced a trial of a method of definite assignment of work by sections, for each hour of attendance. The method will be more fully developed next year.

The allowance made to the Department for conducting a series of public lectures at the Museum of Natural History was expended upon a series of oriental crystal sections. These, supplemented by a suite of positives made by Mr. Whitlock illustrating structure, and by the new Colt lantern, presented by Mr. F. A. Schermerhorn, enabled the Department to satisfactorily illustrate the lectures by lantern experiments.

The publications of the officers of the Department, details of graduate work, and change in collection and equipment are stated in the report to the Dean of the Faculty of Pure Science.

DEPARTMENT OF MINING

The Summer School of Mining, in charge of Professor Peele, assisted by Messrs. Alex. J. Campbell and Charles Of, was held in West Virginia and Virginia. Four weeks were devoted to the study of the deposits and methods of mining in the extensive bituminous collieries of the Pocahontas district in southern West Virginia. The usual mine surveying was done in one of these collieries. Nearly three weeks out of the four were occupied by detail work in the mines of the Caswell Creek Coal and Coke Co., at Bramwell, after which the class visited seven other bituminous mines, most of them situated on Elkhorn River.

This district furnishes excellent examples of large-scale operations, conducted with strict regard to economy in working expenses. A great variety of surface and underground plants was presented for study. The school received a cordial welcome, and every facility for carrying on the class work was afforded by the managers of the various properties. It is worthy of note that the collieries of the Pocahontas field furnish much of the high-grade coal used for the trial trips of the United States war-ships. During the visit of the class to one of the mines a shipment of carefully selected coal was being prepared for the Cramps' shipyards.

The fifth, and last, week of the session was spent at the iron and zinc mines and furnaces near Pulaski, Virginia, visits being made to the Bertha and Wythe mines, producing zinc, iron, and a little lead, and to the Cedar Run iron mines. At the last-named property an interesting surface deposit of hematite ore is being worked.

The class contained eleven students, ten of the fourth year, and one a graduate of 1898 in Civil Engineering, intending to take the Mining course.

DEPARTMENT OF PHYSICS

The regular courses of instruction, both in the lecture-room and the laboratories, as provided in the curriculum, have been given, and all the facilities at the command of the Department are being most thoroughly utilized. Considerable new apparatus has been added during the year, making it possible to arrange a number of new experiments in the laboratory courses, and also to duplicate others that are in constant use. In the electrical laboratory, the addition of new galvanometers, standards, and bridges renders the work of instruction more effective, and at the same time provides the students with the means to measure absolutely electromotive force by several methods, also the strength of magnetic field, and current. A new Thomson Bridge of the most improved design has also been acquired, with which it is possible to measure very accurately the conductivity of large copper bars and wire. In the general and optical laboratories the new additions have been mainly duplications of existing apparatus, though the equipment of the spectrometer room has been increased by two Bunsen spectroscopes of new pattern. In the research laboratories there has been considerable activity, and important researches by members of the staff and advanced students have been finished or are in progress. In particular it is to be noted that students of the fourth and third years have undertaken either for thesis work, or voluntarily, minor researches, while the number of graduate workers in the laboratories has been greater than ever previously. The meteorological apparatus, to which allusion was made in the last report, has been put in operation, and daily observations are made by officers of the Department and posted on the bulletin board on the first floor of Fayerweather Hall.

The attendance of students on the various courses and in the laboratories has been as follows:

LECTURE COURSES

Course I—General Physics, Light and Heat (first half-year), Sound and Electricity (second half-year).

Prof. Rood and Mr. Gordon.
First-Year Class (except students in the School of Architecture)..................... 111

Course III—Units and Measurements (first half-year), Exact Electrical Measurements (second half-year).
Prof. Hallock.
Second-Year Students in the Schools of Mines, Chemistry, and Engineering..................... 95

LABORATORY COURSES

	First Class	Second Class
Course in Mining Engineering............	10	8
" " Civil "	8	11
" " Electrical "	7	24
" " Mechanical "	21	16
" " Chemistry.....................	7	8
	53	67
Student engaged in special research work (fourth year)......................		1
Student engaged in special research work (third year).......................		1
Students making good deficiency in Entrance Laboratory Work..................		18
Total number of students from Schools of Applied Science in Laboratories.....		140

SCHOOL OF POLITICAL SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report of the work of the Faculty of Political Science for the scholastic year 1898–99. During the year, 240 students have taken courses of instruction under the Faculty of Political Science. Of these, 57 were also registered in the Law School, 13 in the School of Philosophy, 1 in the School of Pure Science, 37 were members of the College, 1 was a member of the School of Applied Science, and 27 pursued studies in the Union Theological Seminary. Of the 240 students taking courses in the School of Political Science, 168 held college degrees on entrance, and 37 had completed the Junior year of the College.

Of the 168 students holding college degrees upon entrance into the School,

122	had	the	degree	of	Bachelor	of	Arts.
15	“	“	“	“	“	“	Science.
13	“	“	“	“	“	“	Philosophy.
10	“	“	“	“	“	“	Letters.
2	“	“	“	“	“	“	Divinity.
9	“	“	“	“	“	“	Laws.
1	“	“	“	“	“	“	Sacred Theology.
36	“	“	“	“	Master	“	Arts.
2	“	“	“	“	“	“	Science.
1	“	“	“	“	“	“	Laws.
1	“	“	“	“	“	“	Philosophy.
1	“	“	“	“	Doctor	“	Philosophy.
1	“	“	“	“	Testimonium Maturitatis.		
214							

Deduct 46 for students holding more than one degree.

168

The students in the School received their degree, or degrees, from the following institutions:

Adrian College	1
Allegheny College	2
Amherst College	5
Boston University	3
Brown University	3
Bryn Mawr College	1
Colgate University	1
College of the City of New York	20
Columbia University	49
Cornell University	5
Curry University	1
Dickinson College	1
General Theological Seminary	1
Hamilton College	1
Hamline University	1
Harvard University	7
Hobart College	4
Illinois College	1
Indiana Law School	1
Indiana University	2
Iowa Wesleyan University	1
Johns Hopkins University	2
Knox College	2
Lake Forest University	1
Leland Stanford University	1
Lenox College	1
MacMinnville College	1
Marietta College	1
Mt. Pleasant (Iowa) University	1
National Law School	1
National Normal University	1
Nebraska State University	1
New York Law School	1
New York University	5
Oberlin College	2
Odessa Gymnasium	1
Ohio University	1
Ohio Wesleyan University	2
Oxford University	1
Princeton University	5
Roanoke College	1
Smith College	4
State University of Iowa	2
St. Francis Xavier College	2

St. John's College, Maryland	1
St. Lawrence University	1
Syracuse University	2
Tehuacana University	1
Toronto University	1
Trinity College (Conn.)	1
Trinity College (N. C.)	1
Union Theological Seminary	1
University of California	2
University of Colorado	1
University of Denver	1
University of Halle, Germany	1
University of Michigan	4
University of Minnesota	3
University of Nebraska	2
University of North Dakota	1
University of Tennessee	1
University of Texas	2
University of Vermont	1
University of Virginia	1
University of Wisconsin	2
University of Wooster	2
Vanderbilt University	3
Vassar College	6
Wabash College	1
Wesleyan University (Conn.)	2
Western Reserve University	2
Westminster College	1
Williams College	4
Wofford College	1
Yale University	10
Total number of degrees	214

Inasmuch as we have, at Columbia, made the beginning of the Senior year the commencement of the University work, we must add to the 168 students having degrees the 37 other students who have completed the Junior year. There are, then, 205 University students in full standing, who have done work during the present year under the Faculty of Political Science.

COURSES OF INSTRUCTION

GROUP I.—HISTORY AND POLITICAL THEORY

A.—European History

Instructor		Courses	Hours per Week	Total Number of Students
Prof. Sloane	1.	History 15. The Work of Napoleon	1st half-year 2	5
Prof. Robinson	2.	History 13. Opening of the Lutheran Reformation	2	6
Prof. Robinson	3.	History 11. Antecedents of Modern European History; the Reformation	2	24
Prof. Osgood	4.	History 16. The Constitutional History of England to 1689	2	10
Prof. Robinson	5.	History 22. Seminar in Later Mediæval and Modern European History	1	15
Prof. Robinson	6.	History 14a. Continental History; France under Louis XVI; the Antecedents and Opening of the French Revolution.	1st half-year 2	18
Prof. Sloane	7.	History 14b. Continental History; the Age of the Revolution from 1791 to 1815	2d half-year 2	6
Prof. Munroe Smith	8.	History 7. Political and Constitutional History of Rome.	1st half-year 2	5

B.—American History

Instructor		Courses	Hours per Week	Total Number of Students
Prof. Burgess	1.	History 31. Political and Constitutional History of the United States	2	79
Prof. Sloane	2.	History 34. European Politics and the War of 1812	2d half-year 2	6

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Osgood	3. History 33. American Colonial History during the 18th Century	2	17

C.—Political Philosophy

Instructor	Courses	Hours per Week	Total Number of Students
Mr. Merriam	1. History 40. General History of Political Theories	2	12
Mr. Merriam	2. History 41. American Political Philosophy	2	4
Mr. Merriam	3. History 42. Seminar in Political Philosophy	1	1
Prof. Osgood	4. History 37. Seminar in American Colonial History	1	1

GROUP II.—PUBLIC LAW AND COMPARATIVE JURISPRUDENCE

A.—Constitutional Law

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Burgess	1. Public Law 1. Comparative Constitutional Law of the Principal European States and of the United States	2	34
Prof. Burgess	2. Public Law 5. Seminar in Constitutional Law	1	23

B.—International Law

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Moore	1. Public Law 6. History of Diplomacy	1st half-year 2	8
Prof. Moore	2. Public Law 7. History of American Diplomacy	2d half-year 2	8
Prof. Moore	3. Public Law 8. International Law	2	27
Prof. Moore	4. Public Law 10. Seminar in International Law	2	6

C.—Administrative Law

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Goodnow	1. Public Law 16. Comparative Administrative Law of the United States and the Principal European States	2	33
Prof. Goodnow	2. Public Law 18. The Law of Taxation.	1	14
Prof. Goodnow	3. Public Law 20. Seminar in Administrative Law	1	3

D.—Roman Law and Comparative Jurisprudence

Prof. Munroe Smith	1. Jurisprudence 21 and 22. Roman Law	2	10
Prof. Munroe Smith	2. Jurisprudence 24. Comparative Jurisprudence	2	8
Prof. Munroe Smith	3. Jurisprudence 25. International Private Law	1	2
Prof. Munroe Smith	4. Jurisprudence 29. Seminar in Legal History and Comparative Legislation	1	4

GROUP III.—ECONOMICS AND SOCIAL SCIENCE

A.—Political Economy and Finance

Prof. Mayo-Smith	1. Economics 3. Practical Political Economy	3	68
Prof. Mayo-Smith	2. Economics 3d. Readings in Marshall's Principles of Economics	1	13
Prof. Seligman	3. Economics 4. Science of Finance	2	51
Prof. Seligman	4. Economics 8. History of Economics.	2	19

Instructor		Courses	Hours per Week	Total Number of Students
Prof. Clark	5.	Economics 9. Natural Standards; Wages and Interest	1st half-year 2	11
Prof. Clark	6.	Economics 10. Distribution as Affected by Industrial Changes	2d half-year 2	8
Prof. Clark	7.	Economics 11. Socialism	1st half-year 2	27
Prof. Clark	8.	Economics 12. Social Reforms	2d half-year 2	25
Profs. Seligman and Clark	9.	Economics 14. Seminar in Political Economy and Finance.	2	20

B.—Sociology and Statistics

Instructor		Courses	Hours per Week	Total Number of Students
Prof. Mayo-Smith.	1.	Sociology 17. Statistics and Sociology	1st half-year 2	17
Prof. Mayo-Smith.	2.	Sociology 18. Statistics and Economics	2d half-year 2	19
Prof. Mayo-Smith.	3.	Sociology 29. Laboratory Work in Statistics	fortnightly 2	12
Prof. Giddings	4.	Sociology 15. Principles of Sociology	2	9
Prof. Giddings	5.	Sociology 20. General Sociology	1st half-year 2	35
Prof. Giddings	6.	Sociology 21. Progress and Democracy	2d half-year 2	37
Prof. Giddings	7.	Sociology 22. Pauperism, Poor Laws, and Charities	1st half-year 2	20
Prof. Giddings	8.	Sociology 23. Crime and Penology	2d half-year 2	23
Prof. Giddings	9.	Sociology 30. Seminar in Sociology and Statistics	fortnightly 2	22
Dr. Ripley	10.	Sociology 16. Applied Anthropology.	2d half-year 2	21
Dr. Bayles	11.	Sociology 24. Civil Aspects of Ecclesiastical Organizations	1	6

SEMINAR IN LATER MEDIÆVAL AND MODERN EUROPEAN HISTORY

Professor Robinson. 2 hours every other week. 15 members.

The year has been devoted to a study of the development of the reform movement in France which culminated in the Revolution of 1789. Besides reading and discussing the standard treatises of Taine and De Tocqueville, and parts of the *Spirit of Laws* and the *Social Contract*, the members read the following papers:

The Remonstrances of the *Parlements* and their Theories of a Constitution	R. K. Richardson.
Periodical Publications in France, 1750–1789.	Julia H. Farwell.
The Abolition of the *Parlements* by Maupeon,	L. R. Schuyler.
The Financial Contributions of the Church to the State	A. L. P. Dennis.
Mirabeau and the Reform Movement before 1789	J. T. Shotwell.
Beaumarchais and the Reform Movement	Grace S. Williams.
The Political Ideals of the Economists	C. L. Becker.
English Influence upon France in the 18th Century	L. Einstein.
Sale of Offices in France before 1789.	H. G. Plum.
The Dutch Taxes	L. B. Morse.
The Lettres de Cachet	Flora C. Torrence.
The Encyclopædia	Clara Berg.
English and American Impressions of France in the 18th Century	G. W. Peck, Jr.

SEMINAR IN AMERICAN COLONIAL HISTORY

Professor Osgood. 1 hour a week. 7 members.

The following Masters' theses have been prepared, read, and discussed by the following students, and on the subjects stated below:

Captain John Smith as an Historian	Sydney H. Herman.
Development of Religious Liberty in New England	J. Aronson.

Roger Williams as an Exponent of Liberty.	J. S. Menline.
The Origin of American Written Constitutions	Samuel M. Fischer.
The Administration of Governor George Clinton in New York, 1743–1753	J. D. Lederman.
New York as a Royal Province	B. S. Heller.

SEMINAR IN POLITICAL THEORIES

Mr. Merriam. 1 hour a week. 1 member.

Mr. E. A. Bayles read papers on

The Political Theory of A. Ferguson.
" " " " David Hume.
" " " " Herbert Spencer.
" " " " J. S. Mill.
" " " " W. Bagehot.

A Comparison of the Theories of Professors Burgess and Dicey on the State in, and back of, the Constitution.

SEMINAR IN COMPARATIVE CONSTITUTIONAL LAW

Professor Burgess. 1 hour a week. 23 members.

The subject of investigation in the Seminar during the past year has been the Judicial Interpretation of the Fourteenth Amendment to the United States Constitution. Each of the members has read a critique upon the interpretation of a given point in the Amendment, and has participated in the discussions upon all parts of it.

SEMINAR IN DIPLOMACY AND INTERNATIONAL LAW

Professor Moore. 2 hours a week. 6 members.

The following formal theses were submitted :

Piracy	H. N. Arnold.
History of Intervention in the United States	W. P. Bordwell.
History of the Relations between Spain and the United States, 1779–1834	A. B. Spingarn.

SEMINAR IN ADMINISTRATIVE LAW

Professor Goodnow. 1 hour a week. 3 members.

The following students read papers, each of which occupied a number of sessions of the Seminar:

History of the United States War Department	A. H. Finney.
History of the Administrative Development of the State of Indiana	William A. Rawles.
History of the United States Pension Legislation	W. H. Glasson.

Further, Mr. C. M. L. Sites has been working under the direction of Professor Goodnow in the preparation of the dissertation which he has submitted this year in part fulfilment of the requirements for the degree of Doctor of Philosophy, entitled "Centralized Administration of Liquor Laws in the American Commonwealths."

SEMINAR IN LEGAL HISTORY

Professor Munroe Smith. 1 hour a week. 4 members.

The Seminar in Legal History was occupied during the year in studying the Development of the Law Maritime, beginning with the relevant titles of the Digest of Justinian, and closing with the French Commercial Code, Book II.

The Seminar was attended by Messrs. Arnegard, Neal, Pope, and Walker.

Mr. Walker submitted a thesis for the Master's degree upon "The History of the Marriage and Divorce Laws of Georgia."

SEMINAR IN POLITICAL ECONOMY AND FINANCE

Professor Seligman. 2 hours bi-weekly. 20 members.

The subjects discussed were: in the first half-year, a study of the factory system; in the second half-year, a study of banking, with supplementary papers on taxation. The papers read were as follows:

Development of the Factory System.	Mr. Pope.
Influence of Machinery on Wages..	Miss Hughan.
Influence of the Factory System on Social Life	Mr. Colton.
Trades Unions and Federations of Labor	Mr. Burke.
Women and the Factory System	Miss Hurd.
The Sweating System	Mrs. Kingsbury-Simkhovitch.
Ricardo's Theories of Paper Money and Banking	Mr. Sano.
Peele's Bank Act, and the Banking and Currency Theories	Mr. Britt.
The German Banking System and Banking Theory	Mr. Willett.
The French Banking System and Banking Theory	Mr. Guthrie.
The Report of the Monetary Commission.	Mr. Johnson.
The Taxation of Tobacco.	Mr. Wait.
The Taxation of Sugar	Mr. Munroe.

In addition, each regular member gave a report on the periodical literature of his subject in America, England, France, Germany, Italy, Russia, and Japan.

SEMINAR IN ECONOMIC THEORY

Professor Clark. 2 hours bi-weekly. 14 members.

In this Seminar papers were presented on the following themes:

Overproduction.
Theory of Price.
Marshall's Theory of Distribution.
The Theory of Rent.
The Theory of Consumption.
The Eight-Hour Movement.
The History of Theories of Value.
Modifications of the Wages-Fund Theory.
Recent Theories of Wages.
Prices under Dynamic Conditions.

STATISTICAL LABORATORY AND SEMINAR

Professor Mayo-Smith. Fortnightly, 2 hours. 12 members.

The students were engaged during the first half-year in practical exercises in the analysis of statistics, with special attention to the theory of probabilities, averages, mean error, etc. During the second half-year some special reports on the Statistics of Pauperism and Poor Relief were written by the following members: Miss Hurd, and Messrs. Appleton, Munroe, Prevey, Tenney, and Willett.

As a practical piece of work, the students of the Seminar tabulated and analyzed the returns on about one thousand cards furnished by the Charity Organization Society, in regard to cases of distress occasioned by lack of employment.

SEMINAR IN SOCIOLOGY

Professor Giddings. Fortnightly, 2 hours. 22 members.

The first half of the year was devoted to a review of Social Theory. The exercises included the presentation and discussion of written reports on recent literature, and studies of local communities and city groups. The second half-year was devoted to the reading and discussion of papers by members of the Seminar. The following papers were presented:

A Sociological Study of Religious Revivals in the United States	F. M. Davenport.
The Poor Law of New Jersey	W. L. Hoagland.
Poor Relief in New York City, from the First Settlement to the End of the Dutch Period in 1664	A. A. Tenney.
Social Education in the Elementary Schools	T. J. Jones.
The Commitment of Children by the Magistrates in New York City in 1898	Miss Susan E. Foote.
The Social and Relief Work of the Christian Churches of Manhattan and the Bronx	J. M. Williams.

The following students have been recommended for the degree of Ph.D. during the year 1898–99:

Frank Green Bates,
  Cornell University, B.L., 1891.
  Major subject: American History.
  Minor subjects: European History; Administrative Law.
  Dissertation: Rhode Island and the Federal Union, 1765–1790.

Frederick Smith Hall,
  Wesleyan University, A.B., 1893.
  Major subject: Political Economy.
  Minor subjects: Sociology and Statistics; American History.
  Dissertation: Sympathetic Strikes and Sympathetic Lockouts.

John Randolph Neal,
  University of Tennessee, A.B., 1893.
  Vanderbilt University, A.M., 1894; LL.B., 1896.
  Major subject: Constitutional Law.
  Minor subjects: Roman Law; Political Economy.
  Dissertation: Disunion and Restoration in Tennessee.

Clement Moore Lacey Sites,
  Ohio Wesleyan University, A.B., 1887; A.M., 1890.
  National University Law School, LL.B., 1890.
  Major subject: Constitutional and Administrative Law.
  Minor subjects: Political Economy; Sociology and Statistics.
  Dissertation: Centralized Administration of Liquor Laws.

Adna Ferrin Weber,
  Cornell University, B.S., 1894.
  Major subject: Political Economy and Finance.
  Minor subjects: Sociology and Statistics; Administrative Law.
  Dissertation: The Growth of Cities in the Nineteenth Century.

Elsie Worthington Clews,
Columbia College, A.B., 1896; Columbia University, A.M., 1897.
Major subject: under Philosophy.
Minor subjects: under Philosophy; Sociology.
Dissertation: The Educational Legislation and Administration of the Colonial Governments.

The following students have been recommended for the degree of M.A. during the year 1898–99;

Louis Kaufman Anspacher,
College of the City of New York, A.B., 1897.
Major subject: under Philosophy.
Minor subjects: European History; Political Philosophy.
Essay: A Comparison between Kant's *Critique of Pure Reason* and his *Critique of Practical Reason*.

Henry Newton Arnold,
Harvard University, A.B., 1896.
Major subject: School of Law.
Minor subjects: International Law; School of Law.
Essay: Questions of General Piracy in the Courts of the United States.

Walter Wheeler Cook,
Columbia College, A.B., 1894.
Major subject: Constitutional Law.
Minor subjects: Criminal Law; Roman Law and Comparative Jurisprudence.
Essay: Citizenship in the United States of America under the XIV. Amendment to the Constitution.

Stephen Pierce Duggan,
College of the City of New York, B.S., 1890; M.S., 1897.
Major subject: Constitutional Law.
Minor subjects: Political Economy and Finance; Philosophy.
Essay: Case of Munn *v.* Illinois.

Julia Hutchins Farwell,
Columbia College, A.B., 1898.
Major subject: European History.
Minor subjects: American History; Philosophy.
Essay: Political Influence of Marie Antoinette during the years 1774–1781.

Adelbert Howard Finney,
University of Michigan, Ph.B., 1896.
Major subject: Administrative Law.
Minor subjects: Criminal Law; European History.
Essay: The National War Department.

Samuel Melvin Fischer,
College of the City of New York, A.B., 1898.
Major subject: American History; Philosophy.
Minor subjects: Political Economy and Finance; Criminal Law.
Essay: Early Colonial Charters and Constitutions.

Frederic Gros,
Hanover College, B.S., 1896.
Major subject: Constitutional Law.
Minor subjects: Criminal Law; Political Economy and Finance.
Essay: Iowa Central Railway Co. *v.* Iowa.

Harry Eugene Gros,
Hanover College, B.S., 1896.
Major subject: Constitutional Law.
Minor subjects: Political Economy and Finance; Roman Law and Comparative Jurisprudence.
Essay: Munn *v.* Illinois, '94 U. S.

Sydney Hubert Herman,
College of the City of New York, A.B., 1898.
Major subject: American History.
Minor subjects: Political Economy and Finance; Criminal Law.
Essay: Capt. John Smith as an Historian—critical estimate.

Jessie Wallace Hughan,
Columbia College, A.B., 1898.
Major subject: Political Economy and Finance.
Minor subjects: Sociology and Statistics; Philosophy.
Essay: The Place of Henry George in Political Economy.

Thomas Jesse Jones,
Marietta College, A.B., 1897.
Major subject: Sociology and Statistics.
Minor subjects: Political Economy and Finance; European History.
Essay: Social Education in the Elementary Schools.

William Thomas Kemp,
St. John's College, Md., A.B., 1897.
Major subject: American History.
Minor subjects: Criminal Law; Administrative Law.
Essay: Bacon's Rebellion.

Lyman Ezra Latourette,
McMinville College, A.B., 1894.
Major subject: Constitutional Law.
Minor subjects: Administrative Law; Criminal Law.
Essay: Whether the Fourteenth Amendment prevents the States from Imposing more Stringent Regulations upon the Granting of Licenses to sell Liquor; from Inflicting Severer Penalties upon any one who has been a second time convicted of crime; or from Impairing the Obligations of Contracts by Purely Judicial Decisions.

Jules Delmore Lederman,
College of the City of New York, A.B., 1898.
Major subject: American History.
Minor subjects: Political Economy and Finance; Criminal Law.
Essay: The Administration of George Clinton, 1743–1753.

T. Augustin Ledwith,
College of St. Francis Xavier, A.B., 1897.
Major subject: Constitutional Law.
Minor subjects: Political Economy and Finance; Roman Law and Comparative Jurisprudence.
Essay: Ex-Parte Virginia.

Caroline Tilden Mitchell,
Smith College, B.L., 1897.
Major subject: Philosophy.
Minor subjects: European History; Political Philosophy.
Essay: History-Teaching in Germany and America.

George William Peck, Jr.,
Cornell University, Ph.B., 1897.
Major subject: European History.
Minor subjects: Church History; Sociology and Statistics.
Essay: An Anglo-American Eye-Witness's Review of the French Revolution.

Comadore Edward Prevey,
University of Wisconsin, B.L., 1895.
Major subject: Sociology and Statistics.
Minor subjects: Political Economy and Finance; American History.
Essay: Economic Bearings of American Agriculture.

Joseph Perry Ratzell,
Franklin and Marshall College, A.B., 1896.
Major subject: Sociology and Statistics.
Minor subjects: Political Economy and Finance; Church History.
Essay: The Tramp among the Pennsylvania Germans.

Robert Kimball Richardson,
Yale University, A.B., 1898.
Major subject: European History.
Minor subjects: American History; International Law.
Essay: The *Parlements* and the French Revolution.

Thomas Gaskell Shearman, Jr.,
Yale University, A.B., 1889.
Major subject: Sociology and Statistics.
Minor subjects: Criminal Law; Church History.
Essay: The Expenditure and Economy of the Self-Supporting Poor.

Arthur Barnett Spingarn,
Columbia College, A.B., 1897.
Major subject: International Law.
Minor subjects: Criminal Law; European History.
Essay: History of the Relations between Spain and the United States, 1779–1834.

John Walter Stephens,
Trinity University, A.B., 1893.
Cumberland University, B.D., 1896.
Major subject: Philosophy.
Minor subjects: Sociology and Statistics; Philosophy.
Essay: The Relation of the Motives to Character and Conduct.

Nathan Stern,
Columbia College, A.B., 1898.
Major subject: Philosophy.
Minor subjects: Sociology and Statistics; Philosophy.
Essay: Divination and Magic among the Jews.

Frederick Emerson Stockwell,
Brown University, A.B., 1890.
Union Theological Seminary, B.D., 1898.
Major subject: Philosophy.
Minor subjects: Church History; Philosophy.
Essay: The Psychology of Paul.

Alvan Alonzo Tenney,
Columbia College, A.B., 1898.
Major subject; Sociology and Statistics.
Minor subjects: Political Economy and Finance; Constitutional Law.
Essay: Poor-Relief in New York City from the time of its Settlement to its Capture by the English in 1664.

Stallo Vinton,
Columbia College, A.B., 1898.
Major subject: Constitutional Law.
Minor subjects: Administrative Law; Political Economy and Finance.
Essay: An Analysis and Criticism of the Cases: Hurtad *v.* California, and Elk *v.* Wilkins.

Roberts Walker,
Amherst College, A.B., 1896.
Major subject: School of Law.
Minor subjects: Comparative Jurisprudence; School of Law.
Essay: The Law of Marriage and Divorce of Georgia.

During the year the following gentlemen have held Fellowships in subjects falling under the jurisdiction of this Faculty:

1. Carl Lotus Becker . . Constitutional Law
   University of Wisconsin, B.L., 1896; graduate student, 1896–98.
   Mr. Becker read a paper before Professor Robinson's seminar on "The Political Ideals of the Economists," and made a report on the Memoirs of Bachaumont. He also attended Professor Burgess's seminar in Constitutional Law, before which he read a paper upon the Judicial Interpretation of the Word "State" in the Fourteenth Amendment to the United States Constitution.
2. William Maxwell Burke . . Political Economy
   Oberlin College, A.B., 1896; A.M., 1897.
   Columbia University, University Fellow in Political Economy, 1897–98.
   Mr. Burke continued his investigation in the subject of Central Labor Unions. His dissertation has been completed and will be published by the United States Department of Labor. Mr. Burke also participated in the general sessions of the seminar.

3. William Henry Glasson . . Administration

Cornell University, Ph.B., 1896; Fellow, 1896–97.
University of Pennsylvania, Fellow, 1897–98.

Mr. Glasson has continued his investigation begun before his appointment as Fellow in the University in the subject, "The History of Pension Legislation in the United States." He has reported during the year upon his work before the seminar in Administrative Law, and expects to present his completed dissertation some time during the coming autumn.

4. Newton Dennison Mereness . . History

University of Michigan, A.B., 1892; A.M., 1894.
Columbia University, University Scholar in History, 1895–96.

Mr. Mereness spent the whole of last summer at Baltimore and Annapolis, continuing there his study of the manuscript sources of Maryland history in the 18th century. Throughout the scholastic year he has been at residence in Columbia, and has been constantly at work upon American and European History. He has presented one paper before the advanced seminar in American History, and has been reading Luther's correspondence in connection with Professor Robinson's research course.

5. Jesse Eliphalet Pope . . Economics

University of Minnesota, B.S., 1895; M.S., 1897.
Columbia University, graduate student, 1897–98.

Mr. Pope has continued his investigations into the history and present state of the clothing trade in New York City. After having read all the available literature on the subject, Mr. Pope devoted himself primarily to field-work, collecting facts and forming conclusions. Some of the material has been put into shape, and has been reported upon from time to time in the seminar in Political Economy and Finance, in whose general work he has participated. He has also attended Professor Clark's seminar in Economic Theory.

6. Comadore Edward Prevey . . Statistics
University of Wisconsin, B.L., 1895.
Yale University, graduate student, 1897–98
Mr. Prevey has taken an active part in the work of the seminar and laboratory of statistics, and was especially proficient in investigation in regard to "Lack of Employment." He also attended the seminar in Political Economy and Finance, before which he read a thesis on "Economics of Agriculture."

7. William Roy Smith . . American History
University of Texas, A.B., 1897.
Mr. Smith began work last August on the manuscript sources of the history of South Carolina in the 18th century. Since the beginning of October he has been in residence at Columbia. He has presented two papers before Professor Osgood's advanced seminar, and has also reviewed all the printed sources of South Carolina history which are accessible.

8. Edwin Platt Tanner . . American History
Columbia College, A.B., 1897.
Columbia University, A.M., 1898.
University Scholar in History, 1897–98.
Mr. Tanner spent nearly all of last summer at Trenton, N. J., investigating the history of New Jersey during the early 18th century. Since October he has been doing regular work at Columbia, devoting himself especially to the printed sources of New Jersey history. He has presented two papers before Professor Osgood's advanced seminar.

9. William Henry Fry . .
Columbia University, A.B., 1897; A.M., 1898.
The work of William Henry Fry, Schiff Fellow, has been satisfactory throughout the year. His work has been done under the direction of Professors Sloane and Osgood. He has written an excellent paper on "The Execution of the Duc d' Enghien," having drawn all his material from original sources.

The *Studies in History, Economics, and Public Law*, edited under the management of Professor Seligman, have been continued during the academic year; and the following additional numbers have appeared:

Sympathetic Strikes and Sympathetic Lockouts (Vol. X, No. 1)	Fred H. Hall, Ph.D.
Rhode Island and the Formation of the Union (Vol. X, No. 2),	Frank Green Bates, Ph.D.
The Growth of Cities (Vol. XI, No. 1 complete volume by itself),	Adna F. Weber.
Centralized Administration of Liquor Laws (Vol. X, No. 3),	C. M. Lacey Sites.

In publishing Volume XI, the Series has availed itself of the kind coöperation of the Reform Club in getting the work on the market. Arrangements have been made to issue new editions of some of the older numbers that have now been for some time out of print.

I have to report that quite a number of students who have been recently connected with the School of Political Science have obtained positions either as teachers or in the higher administrative service of the State government.

Frank Green Bates, Ph.D., 1899, has been appointed Instructor in History and Political Science in Alfred College, New York.

C. M. L. Sites, Ph.D., 1899, has been appointed Professor of History and Political Science in the Imperial University, Shanghai, China.

M. R. Maltbie, Ph.D., 1897, has been appointed Secretary of the Committee on Municipal Administration of the New York Reform Club, and is editing the journal entitled *Municipal Affairs*.

Robert H. Whitten, Ph.D., 1898, has been appointed Legislative Librarian of New York State.

A. F. Weber, Ph.D., 1899, has been appointed Deputy Commissioner of Labor Statistics of New York State.

John A. Fairlie, Ph.D., 1898, has been appointed Secretary of the New York State Advisory Canal Commission.

WORK IN HISTORY, ECONOMICS, AND SOCIOLOGY AT BARNARD COLLEGE

Professor Robinson's course in European History, of two hours per week throughout the year, was attended by seven students.

Professor Osgood's course on the Constitutional History of England (History 16), two hours a week throughout the year, was attended by four students.

Professor Giddings's course on the Principles of Sociology (Sociology 15) two hours a week throughout the year, was attended by fourteen students.

Professor Clark's course on Socialism (Economics 11), two hours a week, first half-year, and on Social Reform (Economics 12), two hours a week, second half-year, were attended by seven students.

The *Political Science Quarterly* has maintained its high standard and gained new readers. The problems resulting from war and expansion have been treated in articles on Imperialism, Imperialism and the Civil Service, Government of Distant Territory, Dependencies and Protectorates, and Problems as to the Interoceanic Canal, which have attracted much attention and comment.

The Academy of Political Science, which was reorganized last year, held monthly meetings throughout the winter which were devoted to the discussion of the problems forced upon public attention by the Spanish War and its effects.

At the first meeting, held in November, a paper was read by Professor Giddings, upon "Imperialism," and was discussed by the Hon. Carl Schurz and Dr. Felix Adler.

At the January meeting a paper was read by the Hon. E. L. Godkin, on "A Colonial Civil Service," and was discussed by Mr. Amos K. Fiske and Professor Cunningham of Cambridge University, England.

At the February meeting a paper was read upon "The Nicaragua Canal," by Professor Lindley M. Keasbey, and was discussed by the Hon. George L. Rives.

At the March meeting a paper was read by the Hon. Worthington C. Ford, on "Commerce with the Colonies," and was discussed by Dr. William Z. Ripley.

The arrangement entered into, some four years ago, between Columbia University and Barnard College, whereby Barnard College engaged to pay the salaries of certain Professors called by Columbia University to occupy chairs in the Faculty of Political Science, and Columbia University engaged to render to Barnard College a certain number of hours of separate instruction for each one of these foundations, seems to me to be working very advantageously for all the parties concerned. It has enlarged the Faculty of Political Science, and has greatly improved and enriched the courses of study directed by that body. It has secured to Barnard College, through the prestige and coöperation of Columbia, the services of such men as Columbia University is willing to place in her own Faculties, and intrust with the instruction of her own students. And it has solved very happily the question of the higher education of women, without the risks and embarrassments of co-education. The President of the University and the Dean of Barnard College are to be sincerely congratulated upon the invention of this unique and successful plan of coöperation between the two institutions.

As we adjust ourselves more and more to the details of our new physical surroundings, we find the capacities of the situation continually expanding; and I am happy to report, even more emphatically than in my last annual communication, that my colleagues in this Faculty are all fully convinced that the accuracy of the scholarship of our students is continually improving and the quantity of their knowledge increasing. There is no doubt that the physically ideal position which we now occupy is aiding us very greatly in developing the minds and characters of the students intrusted to our care, as well as in advancing the arts and the sciences themselves.

Very respectfully submitted,
JOHN W. BURGESS,
Dean.

SCHOOL OF PHILOSOPHY

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit herewith the ninth annual report on the work of the Faculty of Philosophy. This report covers the academic year ending June 30, 1899. The various courses of instruction and research offered by the Faculty, together with a statement of the attendance of graduate students upon each, are summarized in the accompanying tabular view marked A. A list of the University Fellows appointed in the departments falling under the jurisdiction of this Faculty, together with an outline of the special work of each during the year, will be found in the accompanying statement marked B. A list of the recommendations for University degrees, made during the year, so far as concerns students having their major subject under this Faculty, is given in the statement marked C.

During the year the number of students pursuing their studies either wholly or in part under the direction of this Faculty has been 321, an increase as compared with the preceding year of 66, or 25.8 per cent. The composition of the list of students is as follows:

1. Candidates for the degree of Bachelor of Arts:		
Seniors in Columbia College	42	
Seniors in Barnard College	21	
Total		63

2. Students holding a bachelor's degree, or its equivalent from a foreign institution:		
Men	114	
Women—registered through Barnard College	45	
Men— " " Teachers College	23	
Women— " " " "	11	
		193
3. Not included in the above classes		65
		321

In the above list are included, as in previous years, the Seniors in Columbia College and in Barnard College who elected courses in Philosophy, Philology, or Letters as part of their work toward the degree of Bachelor of Arts. Hereafter, in consequence of the amendment to the Statutes, made pursuant to the recommendation of the University Council, adopted at a meeting held December 20, 1898, these students will no longer be included in the tables for the year.

PRIMARY REGISTRATION

Until the present year, because of the complexities of registration, it has been almost impossible to determine accurately the primary registration in the Faculty of Philosophy. As the result of an analysis of the published statistics, I have come to the conclusion that the following table represents with substantial correctness the primary registration in the Faculty of Philosophy since its establishment in 1890. The figures for the years 1890–93, inclusive, appear to be correct; those for the years 1894–99, inclusive, are, beyond doubt, correct. The figures are as follows:

Year	Number of Students Taught		Primary Registration			
1890	—	(apparently)	27 + 9	women	=	36
1891	92	"	55 + 5	"	=	60
1892	130	"	77 + 1	"	=	78
1893	130	"	73 + 10	"	=	83
1894	165		83 + 12	"	=	95
1895	190		95 + 17	"	=	112
1896	227		108 + 22	"	=	130
1897	263		100 + 51	"	=	151
1898	255		121 + 37	"	=	158
1899	321		132 + 88	"	=	220

In arriving at a statement of the primary registration for the academic year 1898–99, it is necessary, in order to establish a just comparison with previous years, to include the number of students from Teachers College who have taken one or more courses under the Faculty of Philosophy. On this basis the primary registration for the past year is as follows:

Students primarily registered in the Faculty of Philosophy		105
Students registered in Teachers College:		
Men	27	
Women	42	
		69
Students registered in Barnard College		46
		220

Of the number of students enrolled under the Faculty, 24 were students in the theological seminaries of New York, admitted in accordance with the resolutions of the Trustees passed April 7, 1890. Of this number, 12 came from the Union Theological Seminary, 7 from the General Theological Seminary, and 5 from the Jewish Theological Seminary. This is a decrease, compared with last year, of 17 students from Union Seminary, and an increase of 1 from the Jewish Seminary.

The number of auditors enrolled during the year was 28, a decrease of 5 over 1897–98. Of this number, 2 attended courses in Anthropology; 1, courses in Education; 2, courses in English; 1, courses in French; 3, courses in German; 3, courses in Literature; 4, courses in Music; 5, courses in Philosophy; 2, courses in Psychology; 6, courses in Rhetoric; 1, courses in Romance Literature; 1, courses in Semitic.

DEGREES HELD BY STUDENTS

The degrees held by the 197 graduate students were as follows:

Degrees signifying a liberal or general education :

Bachelor of Arts	144	
Bachelor of Philosophy	6	
Bachelor of Science	22	
Bachelor of Literature	13	
Bachelor of Sacred Theology	1	
		186

Degrees signifying a technical or professional education :

Bachelor of Divinity	3	
Bachelor of Laws	3	
Bachelor of Pedagogy	2	
Civil Engineer	1	
Electrical Engineer	2	
Mining Engineer	1	
		12

Advanced degrees:

Master of Arts	60	
Master of Science	4	
Master of Mechanical Engineering	1	
Doctor of Medicine	1	
Doctor of Philosophy	2	
		68

Total	266
Deduct for students holding more than one degree	69
	197

INSTITUTIONS REPRESENTED

The 197 students holding degrees represented the following colleges and universities:

Adrian College	1
Alfred University	2
Amherst College	2
Antioch College	1
Boston University	3
Brooklyn Polytechnic Institute	2
Brown University	3
Bryn Mawr College	2
Colgate University	4
College of the City of New York	23
Columbia University	53

Cornell University	8
Dartmouth College	1
Delaware College	1
Dickinson College	2
General Theological Seminary	1
Hamline University	1
Harvard University	13
Hobart College	1
Indiana State University	1
Iowa Wesleyan University	1
Johns Hopkins University	3
Kansas State University	1
Knox College	1
Lafayette College	3
Massachusetts Agricultural College	1
Mt. Holyoke College	2
Mt. Pleasant University (Pa.)	1
National University Law School	1
New York Law School	1
New York University	4
Oberlin College	1
Ohio Wesleyan University	2
Oroomiah University (Persia)	1
Oxford University (England)	1
Princeton University	5
Rutgers College	2
St. Francis Xavier College	1
St. Lawrence University	1
St. Stephens College	1
Smith College	9
Stanford University	3
State Normal College (Albany, N. Y.)	1
Swarthmore College	2
Syracuse University	1
Trinity College (Hartford, Conn.)	1
Tulane University	1
Union Theological Seminary	2
Union University	1
University of California	1
University of Cambridge (England)	1
University of Chicago	1
University of Cincinnati	1
University of Colorado	1
University of Michigan	2
University of Minnesota	2
University of Nebraska	3
University of Pennsylvania	1
University of Texas	1

University of Vermont	2
University of Virginia	1
University of Wisconsin	2
Vassar College	9
Wabash College	4
Wellesley College	2
Wesleyan University (Conn.)	3
Westminster College	1
Williams College	1
Woman's College (Baltimore)	2
Wooster University (Ohio)	2
Yale University	3
71 institutions Total	226
Deduct for duplication	29
Total	197

NUMBER OF COURSES GIVEN

The number of courses given during the year 1898–99 by the several departments represented in this Faculty, as compared with those of the previous year, was as follows:

	Number of Courses	Increase	Decrease
English	6	—	1
Germanic Languages	13	2	—
Greek	9	1	—
Indo-Iranian Languages	5	—	4
Latin	10	2	—
Literature	9	—	4
Music	5	1	—
Philosophy and Education	11	2	—
Psychology and Anthropology	12	—	—
Rhetoric	6	1	—
Romance Languages	15	3	—
Semitic Languages	15	—	4
Totals	116	12	13
			12
Net decrease			1

COMPARATIVE STATISTICS, 1890–99

In the following table is given a comparative statement of the enrolment under this Faculty since its foundation.

	1890–1	1891–2	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8	1898–9
Total enrolment	92	130	130	165	190	227	263	255	321
Number holding degrees	52	56	62	92	120	147	131	165	197
Per cent	56.5	43.0	47.7	55.7	63.1	65.2	49.9	64.3	61.4
Seniors in Columbia College and students of equivalent standing	32	41	58	55	51	62	74	61	63
Per cent	34.8	31.5	46.6	33.3	26.9	27.3	28.1	23.9	19.6
Not included in either of the above	8	33	10	18	19	17	58	29	61
Per cent	8.7	25.5	5.7	11.0	10.0	7.5	22.0	11.8	19.0

The number of Seniors in the College electing courses in Philosophy, Philology, and Letters each year has been as follows:

	1890–1	1891–2	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8	1898–9
Number in Senior class	49	50	71	70	49	56	59	49	53
Number electing studies in Philosophy, Philology, and Letters	32	38	57	55	41	44	53	40	42
Per cent	65.3	76.0	80.3	78.6	83.7	76.6	90.0	81.6	79.2

The total number of Seniors in Barnard College electing courses in the Faculty of Philosophy was 21, the entire membership of the Senior class. Their courses were distributed among the several departments as follows:

English	11
French	3
German	5
Greek	12
Latin	5
Music	1
Philosophy and Education	28
Psychology and Anthropology	1
Rhetoric	10

DISTRIBUTION OF STUDENTS, 1898–99

The following table is now inserted for the first time in this report and is of interest, since it gives, in convenient form for reference, the distribution of the students among the various departments included in the Faculty, these departments again being grouped in the natural Divisions to which they belong:

	Courses open to graduates	Enrollment of graduate students	Pursuing two courses	Pursuing three courses	Pursuing four courses	Pursuing five or more courses	Candidates for Ph.D. whose major subject is in the Department	Candidates for Ph.D. one of whose minor subjects is in the Department	Candidates for A.M. whose major subject is in the Department	Candidates for A.M. one of whose minor subjects is in the Department	Students not candidates for a degree	Total number of different *individuals* enrolled
Division of Philosophy and Psychology:												
Philosophy and Education	11	231	23	10	13	11	23	15	41	12	61	152
Psychology	8	61	17	5	1	0	6	9	1	7	8	31
Anthropology	5	32	5	0	0	0	0	7	0	1	19	27
Division of English and Literature:												
English	5	21	4	0	0	0	1	9	0	3	4	17
Literature	10	74	10	4	3	1	11	3	7	13	9	43
Rhetoric	2	17	16	0	0	0	0	0	1	7	8	16
Division of Classical Philology:												
Greek	8	38	2	4	1	1	4	2	5	10	0	21
Latin	[No report received]											
Division of Modern European Languages:												
Germanic Languages	14	35	5	0	1	2	3	2	1	1	12	19
Romance Languages	15	38	5	4	0	2	8	2	1	2	3	16
Division of Oriental Languages:												
Semitic Languages	11	55	3	1	3	7	11	4	0	0	4	19
Indo-Iranian Languages	7	14	1	0	0	2	1	1	0	0	2	4
Department of Music	3	41	35	11	2	1	0	1	0	3	61	65

FACULTY LEGISLATION

The following extracts from the Minutes of the Faculty record the most important legislation of the year:

(April 14, 1899)—*Resolved*, That the Trustees be requested to authorize the President to assign Professor James E. Russell, Dean of Teachers College, and Professor of the History of Education, and Professor Frank M. McMurry, Professor of the Theory and Practice of Teaching in Teachers College, to seats in the Faculty of Philosophy.

(April 14, 1899)—*Resolved*, That the requirement of the ability to read Latin at sight as a condition precedent to the attainment of the degree of Doctor of Philosophy be referred in each case, with power, to a committee consisting of the Dean, the Professor of Latin, and the Professor in charge of the candidate's major subject.

(April 14, 1899)—*Resolved*, That a committee to consist of five members, with the President as chairman, be appointed to consider and report what changes, if any, are desirable in the method of administering the requirement of ability to read at sight Latin, French, and German, as pre-requisites for the degree of Doctor of Philosophy.

Acting under the authority conferred by the second resolution just cited, the duly constituted committee, on consideration of the facts in each case, made no requirement in respect of the ability to read Latin at sight in the case of three candidates for the degree of Doctor of Philosophy, Messrs. Breese, Dexter, and Woodworth, each of whom had for his major subject Psychology.

The third resolution referred to was the result of a discussion in the Faculty as to the unsatisfactory character of the present requirement as to the ability to read at sight Latin, French, and German, made of candidates for the degree of Doctor of Philosophy. It is felt by many members of the Faculty that if this requirement is to be insisted upon at all, it should be made not at the close of the candidate's period of study as now, but at the time of his acceptance by the University as a candidate for the degree. The provision for a committee to consider the whole subject is timely, and during the coming year the question will doubtless be discussed in all its aspects.

THE DIVISION AS A UNIT OF ORGANIZATION

It is interesting to observe that as the University develops, a new unit of organization, not yet recognized in any formal or official way, has come into view to meet a well-defined demand. This unit is the Division, a name now used both at Columbia and elsewhere, for a group of related departments within a given Faculty or School. By means of a very informal divisional organization, it is possible to adjust more easily the courses of instruction offered by several related departments to each other, to increase coöperation and inter-dependence between them, and to add noticeably to their efficiency.

In the Faculty of Philosophy this divisional organization has recently come to play a prominent part. The Faculty naturally falls into six Divisions as follows:

Division of Philosophy and Psychology, including the Departments of Philosophy and Education, and of Psychology and Anthropology.

Division of Classical Philology, including the Departments of Greek and Latin.

Division of English and Literature, including the Departments of English, Literature, and Rhetoric.

Division of Modern Languages, including the Departments of Romance Languages and of Germanic Languages.

Division of Oriental Languages, including the Departments of Semitic Languages and of Indo-Iranian Languages.

The Department of Music stands by itself.

It would be no slight gain to the work of the University, and a measure of economy as well, if all of these natural Divisions should follow the example of some of them, and substitute a divisional announcement for a series of separate departmental announcements, and so present to the public an appearance of greater unity and better organization in the conduct of their work.

TEACHERS COLLEGE

The most important fact of the year is the successful operation of the agreement, under the terms of which Teachers College has become a member of the University. The coöperation between the Faculties has greatly multiplied the opportunities offered to advanced students, and has greatly strengthened and extended the work which was already in operation. It will be an additional source of strength to have the Professor of the History of Education and the Professor of the Theory and Practice of Teaching, in Teachers College, sit with the Faculty of Philosophy, as they will do hereafter.

The fact that Teachers College has now become an integral part of the University, may well serve as the occasion for putting on record, for the first time, the story of how there came to be such an institution at all. The story has an interesting bearing upon the history and influence of Columbia University.

The idea which led to the foundation and development of Teachers College was suggested by reading the remarkable discussions of education as a subject of university study, which were contained in the annual reports of President Barnard for 1881 and for 1882. In his report for 1881, President Barnard sketched the organization and work of a university department of the history, theory, and practice of education; he added (page 39) that "Education is nowhere treated as a science, and nowhere is there an attempt to expound its true philosophy." In illustration of the practical benefits to follow from the establishment of such a department, President Barnard proceeded to outline the work of an ideal school, conducted with regard to ideal educational ends, with a wisdom and force that make this discussion a permanent contribution to the literature of education.

In the following year President Barnard returned to the discussion of this subject, and called the attention of the Trustees (page 54) to the fact that the science and art of education had been included in the very remarkable university scheme proposed for adoption in 1858. These discussions by President Barnard opened an entirely new field for reflection and study, and as a result there developed the idea of a college for teachers, established as an integral part of the Columbia University which was already beginning to take form.

The plan for such a college was subsequently worked out in some detail, and met with the complete approval of President Barnard. Still later it was submitted to leading educationists in Europe, all of whom expressed the opinion that to carry such a plan into effect would be to take a step forward that would be memorable in the history of education.

In 1886, an attempt was made to test the demand for systematic instruction in the history, principles, and practice of education, and a course of four public lectures on this subject was offered by authority of the Trustees. Admission to these lectures was by ticket, but tickets were freely distributed to applicants in the order of their applications. Although the subject was an entirely new one, and, as President Barnard points out in his report for 1886, one more likely to attract the studious few than the curious many, the applications for tickets numbered more than 2000. The lectures were delivered in the largest hall at the disposal of the University, to audiences which crowded the room in every part, scores of persons being compelled to stand during an entire lecture. At the conclusion of the course more than 200 of those who had been in attendance accepted the invitation of the lecturer to provide them with printed bibliographies and direction for further study. The success of this experiment made it plain that the time was ripe for undertaking in some way the systematic exposition of the history, principles, and practice of education, on a high plane.

After full conference with President Barnard, the opinion was arrived at, chiefly at his instance, that it would probably be easier to build up a teachers' college outside of the University, and to bring it later into organic relations with the University, than to undertake at that time its establishment under the control and at the expense of the Trustees.

During the autumn of 1886, therefore, much consideration was given to the practical steps necessary to carry the proposed plan into effect. By a fortunate circumstance, the results of which have been almost too happy to attribute it wholly to chance, the Industrial Education Association served as the occasion for the realization of the ideal of a teachers' college on a university basis.

The Industrial Education Association had been in existence for sixteen years, under one name or another, and was composed of an earnest body of representative men and women whose declared aim was the development of domestic, industrial, and manual training. This Association had been most successful in stimulating public interest in these subjects, as well as in demonstrating, in a simple way, how such instruction could be best organized and imparted. The Association was, however, not educational, but philanthropic, in aim and purpose, and the steps by which it grew from a philanthropic organization to an educational force are an interesting and characteristic chapter in the history of education in the United States. So much public interest had been aroused and so much support had been obtained for the work of the Association, that it found itself, toward the close of 1886, face to face with large responsibilities and with the necessity for undertaking greatly increased expenditures, if its ideals were to be carried to a practical realization. The declaration of principles which the Association adopted at that time must, I think, be considered as one of the most enlightened, forceful, and concise statements of the principles underlying manual training, that has ever been published.

In organizing for the broader field of work that now lay before it, the Industrial Education Association was moved to appoint as its executive head, one who had learned from President Barnard the high importance of the study of education, and who had determined to bring about the University study of education and the higher training of teachers, through an institution especially organized for the purpose, if it were within the bounds of possibility to do so.

It at once became apparent to the newly elected President of the Industrial Education Association, that the cause of manual training could only be promoted in a permanent way by thoroughly trained teachers, and it was further apparent that these teachers must be trained so as to view manual training in the light of the history and principles of all education, and not as a special and more or less accidental and temporary addition to the course of study. It was necessary, therefore, in the interest of the manual training movement itself, to transform the Industrial Education Association into an institution for the training of teachers, having a care that manual training was fully recognized in and by such new institution. This policy was at once entered upon. For some months progress was slow, because the men and women who had borne so courageously and so generously the active responsibility for the work of the Industrial Education Association, were strangers to the educational ideas involved in the new departure. Gradually, however, the force of the argument which was constantly kept before them was sufficient to overcome prejudices that were the natural outgrowth of the habit of viewing the introduction of manual training in the light of philanthropy, rather than in the light of education.

While, therefore, the President had been able in his report submitted in May, 1897, merely to indicate the fact that the establishment of a teachers' training college was necessary, yet later in his report dated May 4, 1888, he was able to announce that such a college had been organized and that it had, during its first year of existence, enrolled 104 students. A few months later, on January 12, 1889, the Regents of the University of the State of New York voted the provisional charter of the New York College for the Training of Teachers, which name was afterwards fortunately changed to Teachers College, and the work of the Industrial Education Association was absorbed into the new institution. The history of this institution from 1889 to the present is a matter of public record and need not be recounted here.

I may only say that in my judgment the generosity and the intelligence of this metropolitan community have never been more fully demonstrated than by the response given to the appeals made in behalf of this strictly educational institution, and never have generous self-sacrifice and devotion been more amply rewarded by the results.

From this brief review, therefore, it is apparent that Teachers College of Columbia College, as it now exists, is the fortunate completion of a plan formed so long ago as 1882, and that it not only has realized every detail of the plan as then made, but has in excellence and effectiveness exceeded any expectations which could then have been formed for it.

There are two respects in which the leading American universities are coming more and more under criticism, and it is the part of wisdom to consider how far the policy pursued at Columbia is wise in respect to each of these subjects.

The first relates to the unsatisfactory character of the lecture system, taken by itself, as a method of university teaching; and the second relates to the character and amount of the financial aid extended to university students.

THE LECTURE SYSTEM

The lecture system has been imitated in this country from the German universities, where it has, in many instances, been for years an object not only of criticism but of reproach. The use of the lecture as a means of conveying information already printed or easily accessible in printed form, can hardly be defended. It lacks all of the essential elements of good teaching, and is, in addition, a serious waste of time. The real function of the university lecture is to interpret facts already accessible to the student through text-book, book of reference, or printed syllabus. In addition to these aids, it is becoming more and more advisable to connect with the lecture the systematic quiz, by trained assistants, of students either singly or in groups. In this way the lecture becomes an instrument of high educational value. Without these aids it is, at its best, a very imperfect instrument and one which yields every year, judged from the student's point of view, more and more unsatisfactory results. The old recitation system, for many years familiar to students and teachers in American colleges, had merits peculiar to itself, which should not be overlooked because of its obvious deficiencies. It is not unlikely that the best university teaching of the future will, through dependence upon text-books, a syllabus, and the systematic quiz by assistants, work out a method of its own which will combine the advantages of the old class recitation with those of an interpretative lecture by an inspiring master of his subject.

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

The other topic to which it is advisable to devote a word, is the question whether or not, during the last ten years, the universities in the United States have not multiplied too largely the number of fellowships and scholarships open to graduate students. The endowment of advanced study and research is too noble an aim to be permitted to suffer through its abuse. It is quite possible that through lack of coöperative effort and counsel, the American universities may have so multiplied fellowships and scholarships that they tempt each year into fields of advanced study, men unfit, by natural capacity or temperament, for a scholar's career, and in so doing bring injury rather than advantage to those whom it is sought to benefit.

It is hardly possible that there are coming from the American colleges each year, as many as four hundred or five hundred graduates who can and should be given assistance in the prosecution of university studies. Yet the best information at my command shows that there are at present open in the United States 259 graduate fellowships and 232 graduate scholarships. The distribution of these fellowships and scholarships is shown in the following table, from which the attempt has been made to exclude all foundations or other provision for students of applied science, of the technical arts, or of the learned professions:

Institution		Fellowships		Scholarships
Harvard University		22		51
Boston University		2		0
Brown University		2		Not specified
Yale University		5		13
Cornell University		23		17
New York University		5		7
Princeton University		5		0
Pennsylvania University		35		38
Johns Hopkins University		23		21
Illinois University		8		0
Michigan University		2		0
Wisconsin University		10		3
Nebraska University		Not specified		Not specified
California University		7		7
Chicago University		67		20
Total		216		177
Columbia University :				
University (24) ; Tyndall ; Barnard ; Drisler ; Mosenthal ; Schiff ; Class of '70 ; Schurz ; Proudfit (2) ; Curtis ; Columbia ; McKim (2).	37		38	
Barnard College	1		7	
Teachers College	5	43	10	55
		259		232

Being myself of opinion that provision of this sort has already been carried too far, I welcome the recent amendment to the Statutes of the University by which the number of University Fellowships offered hereafter is reduced from 24 to 18. In this respect I believe that Columbia sets a good example and one worthy to be followed.

SERIES OF PUBLICATIONS

I take pleasure in calling attention to the fact that the Department of Literature has been successful in establishing a series of Publications, entitled Columbia University Studies in Literature, similar to those already established by other departments of the University, particularly the Contributions to Philosophy, Psychology, and Education, and the Studies in History, Economics, and Public Law. The first three numbers of the new series have recently appeared with the imprint of the Columbia University Press, and are in all respects a credit to the University.

The series of Contributions to Philosophy, Psychology, and Education has now reached its seventh volume, and gives satisfactory evidence of the scope and character of the work of the students in those fields of knowledge.

Respectfully submitted,
NICHOLAS MURRAY BUTLER,
Dean.

June 30, 1899.

Statement A

COURSES OF INSTRUCTION, 1898–99

SHOWING THE ATTENDANCE OF GRADUATE STUDENTS, OF AUDITORS, AND THE TOTAL ATTENDANCE UPON EACH

Instructor	Courses	Hours per Week	Graduate Students	Auditors	Total Number Attending
	PHILOSOPHY AND PSYCHOLOGY				
	A.—PHILOSOPHY AND EDUCATION				
	I.—Philosophy				
Prof. Butler	I. Historical and Critical Introduction to Philosophy	3	29	4	81
Prof. Hyslop	II. Ethics, introductory course	2	5		5
Prof. Butler	IV. Modern British Philosophy	2	27		27
Prof. Hyslop	VI. Epistemology and Metaphysics	2	12		12
Dr. Marvin	VII. Descartes, Spinoza, Leibniz	2	2		2
Dr. Jones	VIII. History and Principles of Æsthetics	2	10		10
Dr. Marvin	X. Journal Club	1	12	1	13
Prof. Butler	Seminar in Philosophy	1	8		8
Prof. Hyslop	Seminar in Ethics	2	5		5
	II.—Education				
Prof. Butler	II. Principles of Education	2	67	1	117
Prof. Butler	Seminar in Education	1	12		12
	B.—PSYCHOLOGY AND ANTHROPOLOGY				
	I.—Psychology				
Instructors of the Division	I. Introduction to Psychology	2	25	2	27
Prof. Cattell	II. Experimental Psychology, introductory course	2	11		11
Prof. Cattell	III. Experimental Psychology, laboratory work	2	6		6
Prof. Cattell	IV. Experimental Psychology, advanced course	2	14		14
Prof. Cattell	V. Research work in Experimental Psychology	Daily	11		11
Dr. Farrand	VIII. Physiological Psychology	3	1		1
Dr. Farrand	IX. Abnormal and Pathological Psychology	1	3		3

Instructor	Courses	Hours per Week	Graduate Students	Auditors	Total Number Attending
	II.—Anthropology				
Dr. Farrand	I. Anthropology, introductory course	2	24	2	26
Dr. Farrand	II. Primitive Culture	2	7		7
Dr. Boas	III. Physical Anthropology, introductory course	2	2		2
Dr. Boas	IV. Physical Anthropology, advanced course	2	2		2
Dr. Boas	Special course	Daily	1		1
Dr. Boas	V. Seminar in Anthropology	2	2		2
	CLASSICAL PHILOLOGY				
	I.—Greek				
Prof. Wheeler	X. Greek Literature, Part II, Prose	3	6		6
Prof. Perry	XII. Greek Lyric Poets	3	11		11
Dr. Young	XV. Selections from the Greek Christian Fathers	2	1		1
Prof. Wheeler	XVII. Introduction to Greek Archæology, Part I, Vases	2	2		2
Prof. Perry	XVIII. (*Education.*) Methods of Teaching Greek in Secondary Schools (one-third of year)	1	3		3
Dr. Young	XIX. Lectures on Manners and Customs of the Ancient Greeks	2	8		8
Dr. Young and Prof. Wheeler	XX. Readings from Pausanias	2	7		7
Prof. Perry	XXII. Greek Dialect Inscriptions	1½	3		3
Prof. Perry	XXIV. Methods of Classical Philology	1	7		7
Prof. Wheeler	Greek Seminar	2	6		6
	II.—Latin				
Dr. McCrea	III. Martial Epigrams	3	1		3
Dr. McCrea	IV. Plautus and Terence	2	1		1
Prof. Egbert	V. Roman Epigraphy, Part I	2	6		6
	Part II	1	3		3
Prof. Peck	VI. Rapid Reading of Horace and Ovid	2	7		7
Prof. Egbert	VII. The Annals of Tacitus	2	5		5
Prof. Peck	IX. Greek and Roman Prose Fiction	2	19	1	20
Dr. McCrea	X. Private Life of the Romans	2	2		2
Prof. Peck	XI. Latin Bibliography	2	17		17
Prof. Egbert	XV. Ecclesiastical Latin	2	2		2
Prof. Peck	Seminar in Latin	1	6		6

	ENGLISH AND LITERATURE				
	I.—English				
Mr. Seward	II. Anglo-Saxon Language and Historical English Grammar	2	1		1
Prof. Jackson	III. Anglo-Saxon Literature: Poetry and Prose	2	5		5
Prof. Jackson	IV. Chaucer: Language, Versification, and Method of Narrative Poetry	2	7		7
Prof. Jackson	VII. English Language and Literature of the 16th Century	2	6	2	8
Prof. Woodberry	XI. 19th Century Literature	3	0		19
Prof. Brander Matthews	XVI. American Literature	2	0		23
	II.—Literature				
Prof. Brander Matthews	I. History of Modern Fiction	2	1		29
Prof. Woodberry	II. Theory, History, and Practice of Criticism	3	2		17
Prof. Brander Matthews	IV. Dramatists of the 19th Century	2	7		8
Prof. Brander Matthews	V. Molière and Modern Comedy	2	5		6
Prof. Woodberry	VII. Studies in Literature, mainly critical	3	26	3	29
Mr. Taylor	VIII. Narrative Poetry of the Middle Ages	2	6		6
Mr. Taylor	X. Hellenism	3	10		10
Mr. Taylor	XI. Literary Phases of Transition from Paganism to Christianity	1	8		8
Prof. Woodberry	Seminar in Literature	2	5		5
	III.—Rhetoric				
Prof. G. R. Carpenter	I. English Composition, 1st half-year	3	4		4
Prof. G. R. Carpenter	II. English Composition, 2d half-year	3	3		3
Prof. G. R. Carpenter	III. English Composition, advanced course	2	2	3	19
Mr. Putnam	IV. Elocution	2	5		5
Mr. Brodt	VI. Argumentative Composition	3	3		3
Prof. G. R. Carpenter	VII. Seminar	2	14	2	16
	MODERN LANGUAGES				
	A.—ROMANCE LANGUAGES				
	I.—Romance Philology				
Prof. Todd	I. Introduction to Romance Philology	2	3		3
Prof. Todd	II. Chrétien de Troyes	1	5		5
Prof. Todd	Special course, Old Catalan	1	1		1
Prof. Todd	Seminar in Romance Philology	2	5		5

Instructor	Courses	Hours per Week	Graduate Students	Auditors	Total Number Attending
	II.—Provençal				
Prof. Todd	I. Old Provençal	1	4		4
	III.—French				
Dr. Page	II. General Introduction to French Literature	3	3		3
Prof. Cohn	IV. History of French Literature in the 17th Century	3	1		1
Prof. Cohn	VI. History of French Literature in the 18th Century	3	2		2
Dr. Page	XI. History of Literary Criticism in France	2	2		2
Prof. Cohn	XVII. Methods of Teaching French	2	2	1	3
Prof. Cohn	Seminar in Romance Literature	2	12	1	13
	IV.—Italian				
Prof. Speranza	I. Elementary Course	3	1		1
Prof. Speranza	IV. Critical Study of Dante's Divina Commedia	2	3	2	5
Prof. Speranza	V. History of Italian Literature	1	2	1	3
	V.—Spanish				
Prof. Todd	IV. Origins of Spanish Poetry	2	2		2
	B.—GERMANIC LANGUAGES				
Mr. Babbitt	I. Longer elementary course	6	3		3
Mr. Babbitt	II. Grammar, Reading, and Composition	3	2		2
Mr. Babbitt	IV. Historical Prose	3	4		4
Prof. Thomas	VI. History of German Literature	2	2	2	4
Prof. Thomas	VII. Goethe's Faust	2	7		7
Prof. W. H. Carpenter	IX. History of the German Language	2	3		3
Prof. Thomas	X. Great German Writers	2	6		6
Prof. W. H. Carpenter	XI. Old High German	2	4		4
Prof. Thomas	XIII. Dano-Norwegian	2	2		2
Prof. W. H. Carpenter	XV. Advanced Icelandic	2	5		5
Prof. W. H. Carpenter	XVIII. Germanic Philology	2	4		4
Prof. W. H. Carpenter	Germanic Seminar, 1st half-year only	2	4		4
Prof. Thomas	Seminar in German	2	5		5

	ORIENTAL LANGUAGES				
	I.—Semitic				
Prof. Gottheil	I. Biblical Hebrew, elementary course	2	5		5
Prof. Gottheil	II–III. Biblical Hebrew, second and third courses	2	12	1	13
Prof. Gottheil	IV–V. Post-Biblical Hebrew	2	7		7
Prof. Gottheil	IX. Sabæan Inscriptions	1	6		6
Prof. Gottheil	XII–XIII. Arabic, elementary and second courses	2	5		5
Prof. Gottheil	XIV. Arabic, third course	2	10		10
Prof. Gottheil	XV. Syriac, first course	2	4		4
Prof. Gottheil	XVI. Syriac, second course	2	6		6
Prof. Gottheil	XVIII. Seminar	2	13		13
	II.—Indo-Iranian				
Prof. Jackson	I. Sanskrit, elementary course	3	3		3
Prof. Jackson	III. Sanskrit, advanced course	2	4		4
Prof. Jackson	IV. Avestan, advanced course	2	3		3
Prof. Jackson	V. Palī, elementary course	1	3		3
Prof. Jackson	VIII. Lectures on Sanskrit Literature	1	4		4
Mr. Yohannan	XI. Modern Persian	2	2		2
Mr. Yohannan	XII. Modern Persian	2	2		2
Prof. Jackson	Seminar	1	2		2
	MUSIC				
Prof. MacDowell	I. General Musical Culture	2	0		18
Prof. MacDowell	II. Development of Modern Music	1	3	1	10
Prof. MacDowell	III. Harmony	2	1		36
Prof. MacDowell	IV. Counterpoint and Fugue	2	2		13
Prof. MacDowell	V. Orchestration and Symphonic Form	2	1	2	9

Statement B

UNIVERSITY FELLOWS, 1898–99

1. George Balthasar Germann . . . Education.
   Columbia College, A.B., 1895.
   Subjects of investigation: National Legislation concerning Education in the United States, its Influence and Effect; The Growth of Habit in the Accuracy and Rapidity of Discrimination and Movement.
   Topics for papers or lectures: Doctor's dissertation on National Legislation concerning Education, its Influence and Effect in the Public Land States east of the Mississippi; criticisms of R. Wagner's *Unterricht und Ermüdung;* Phenomena of Self-Activity among the Protista; the Educational Significance of Play; on the Validity of the Æsthesiometric Method for Determining Mental Fatigue; on the Philosophy of Locke, of Berkeley, and of Hume.
2. Louis Herbert Gray . . . Indo-Iranian Languages.
   Princeton College, A.B., 1896.
   Columbia University, A.M., 1898.
   Subjects of investigation: Various topics in Sanskrit, classical and Vedic; in the Avesta; in Pāli; in New Persian; in Arabic; and in Syriac.
   Topics for papers or lectures: The Indo-Iranian Deity Apām Napāt (to appear in the *Archiv für Religions-wissenschaft*); The Sanskrit Suffix-ta; Contributions to Avestan Syntax; The Conditional Sentence (to appear in the *Proceedings of the New York Academy of Sciences*); Certain Parallel Developments in the Pāli and Persian Phonology (to appear in the *Journal of the American Oriental Society*); Ein Beitrag zur indogermanischen Syntax von *nāman.*
   Published: Metres of Bhartrihari, in Journal of American Oriental Society.

3. George Frederick Heffelbower . . . Latin.
   University of Michigan, A.B., 1897; A.M., 1898.
   Subjects of investigation: A full Bibliography of Livius Andronicus; Apuleius, Metamorphoses; Types of Roman Names in Inscriptions; The Roman Collegia.
   Topic for paper or lecture: The Vergil Myth in the Middle Ages.
4. Bert Hodge Hill . . . Greek.
   University of Vermont, A.B., 1895.
   Subjects of investigation: Isocrates' Theory of Education; Vase-Paintings by Duris, and Unsigned Vases in the Style of Duris; The Meleager Myth; The καλός-Name Hippodamas (appearing on eight red-figured Athenian kylikes); Some Questions in connection with certain of the Odes of Bacchylides.
   Topics for papers or lectures: The Vases of Duris; A Possible Identification of the καλός-Name Hippodamas; The Meleager Myth in Art.
5. Owen Benjamin Huntsman . . . Philosophy.
   Harvard University, A.B., 1897; A.M., 1898.
   Subjects of investigation: The Relation of Æsthetics to Ethics in Contemporary Theory; An Experimental Study in Feeling-tones.
   Topics for papers or lectures: Aristotle's Psychology; Aristotle's Conception of Will; Pleasure, and the Intellectual and Moral Virtues according to Aristotle; The Ethical Theory of Hobbes, and of Bentham; papers on the Philosophy of Locke, of Berkeley, and of Hume; a paper on the subject of the Experimental Research.
6. Corliss Fitz Randolph . . . Classical Philology.
   (Henry Drisler Fellow.)
   Alfred University, A.B., 1888; A.M., 1888.
   Subjects of investigation: The History of Greek and Roman Prose Fiction; Private Life of the

Romans; Manners and Customs of the Ancient Greeks; Roman Archæology and Epigraphy; Roman Occupation of Africa.

Topics for papers or lectures: Roman Civilization and Culture in Africa; Glandes Plumbeæ; Res Gestæ Divi Augusti, ex Monumento Ancyrano; Use of Glass among the Romans; Graffiti, or Wall Inscriptions; The Banks of the Tiber; The Pantheon.

7. Arthur Frank Joseph Remy . . Comparative Philology.

College of the City of New York, A.B., 1890.
Columbia University, A.M., 1897.

Subjects of investigation: India and Persia in Mediæval German Literature; Sanskrit "jana," Avestan "zana" (published in the Journal of the American Oriental Society, Vol. 20).

Topics for papers or lectures: The language of the *Heliand* with special reference to primitive Germanic and Indo-Germanic conditions; Germanic Antiquities in the "*Heliand*"; Scheffel's "Gaudeamus"; Hoelderlin and the Romantic School; Hoelderlin's "Hyperion"; The Siegfried-Legend, its Import and Interpretation (Synopsis published in the "Verhandlungen des Deutschen Gesellig-Wissenschaftlichen Vereins," February, 1899); Translation into German of Chapters 3, 4, and 5 of Prof. A. V. W. Jackson's work, "Die iranische Religion," for Geiger and Kuhn's "Grundriss der iranischen Philologie."

8. Rudolf Tombo, Jr. . . . German.

College of the City of New York, B.S., 1895.
Columbia University, A.M., 1898.

Subjects of investigation: The Influence of Ossian on German Literature; The verb in Chaucer's Complaint of Mars.

Topics for papers or lectures: The Manuscripts and the Manuscript Transmission of the "*Heliand*"; The Literary Value of the "*Heliand*"; Friedrich von Hardenberg (Novalis); Novalis and the Romantic Novel; Herder's "Auszug aus einem Briefwechsel ueber Ossian und die Lieder alter Voelker"; Scheffel's "Trompeter von Saekkingen"; Critical Notes on the "Widsith," ii., 1–50; The "Tabard"; The Sources of the Nun's Priest's Tale; The Structure of the Book of the Duchesse; "Wisdom from the 'Choir Invisible'"; "A Time-Honored Relic"; and other notes in the New York *Times*' Review of Books and Art.

9. Robert Sessions Woodworth . . . Psychology.

Amherst College, A.B., 1891.

Harvard University, A.B., 1896, and A.M., 1897.

Subjects of investigation: The Accuracy of Voluntary Movement; History of Sensationalistic Doctrines as Applied to the Will.

Topics for papers or lectures: The Accuracy of Movement, read before the Anthropological Section of the New York Academy of Sciences; demonstration of new apparatus at the Annual Exhibition of the same Academy; Voluntary Muscular Control as Related to Speed and to Fatigue; The Best Movement for Rapid Writing; Hints from the Physiological to the Psychological Laboratory; The Accuracy of Voluntary Movement, monograph supplement to the *Psychological Review*, 1899; review of Mercier's *Les origines de la psychologie contemporaine*, in *Psychological Review*, 1899; portions of the *Psychological Index*, No. 5.

Statement C

RECOMMENDATIONS FOR DEGREES, 1898–99

Of students having the major subject under the Faculty of Philosophy

I.—Doctor of Philosophy:

1. Burtis Burr Breese,
   University of Kansas, A.B., 1896.
   Harvard University, A.B., 1897; A.M., 1898.
   Major subject: Education.
   Minor subjects: Psychology; Education.
   Dissertation: Inhibition.

2. Frank Wadleigh Chandler,
   Polytechnic Institute of Brooklyn, A.B., 1894.
   Columbia University, A.M., 1896.
   Major subject: Literature.
   Minor subjects: French Language and Literature; Philosophy.
   Dissertation: The Romances of Roguery: being a study of the Picaresque Novel, etc.

3. Elsie Worthington Clews,
   Columbia College, A.B., 1896; Columbia University, A.M., 1897.
   Major subject: Education.
   Minor subjects: *Sociology and Statistics;* Philosophy.
   Dissertation: The Educational Legislation and Administration of the Colonial Governments.

4. George Van Ness Dearborn,
   Dartmouth College, B.L., 1890.
   Columbia University, M.D., 1893.
   Harvard University, A.M., 1896.
   Major subject: Psychology.
   Minor subjects: Education; Anthropology.
   Dissertation: The Emotion of Joy.

5. Edwin Grant Dexter,
   Brown University, B.P., 1891 ; A.M., 1892.
   Major subject : Education.
   Minor subjects : Psychology ; Philosophy.
   Dissertation : Conduct and the Weather—an inductive study of the mental effects of definite meteorological conditions.
6. Shepherd Ivory Franz,
   Columbia College, A.B., 1894.
   Major subject : Psychology.
   Minor subjects : Education ; Anthropology
   Dissertation : After-Images.
7. George Balthasar Germann,
   Columbia College, A.B., 1895.
   Major subject : Education.
   Minor subjects : Education ; Psychology.
   Dissertation : National Legislation concerning Education : Its Influence and Effect in the Public Land States East of the Mississippi.
8. Samuel Paul Molenaer,
   Gymnasium at Rival, Testimonium Maturitatis, 1889.
   Major subject : Romance Philology.
   Minor subjects : Romance Literature ; German.
   Dissertation : Egidio Colonna's "Du Gouvernement des Rois."
9. George N. Olcott,
   Columbia College, A.B., 1893.
   Major subject : Latin Language and Literature.
   Minor subjects : Greek ; Greek Archæology.
   Dissertation : Studies in the Word Formation of Latin Inscriptions.
10. William Popper,
   Columbia College, A.B., 1896 ; Columbia University, A.M., 1897.
   Major subject : Semitic Language and Literature.
   Minor subjects : Semitic Language and Literature ; Anthropology.
   Dissertation ; The Censorship of Hebrew Books.

11. Joel Elias Spingarn,
    Columbia College, A.B., 1895.
    Major subject: Literature.
    Minor subjects: Literature; Italian.
    Dissertation: A History of Literary Criticism in the Renaissance.

12. William Ferguson Tamblyn,
    University of Toronto, A.B., 1895.
    Major subject: Latin.
    Minor subjects: Greek; Sanskrit.
    Dissertation: The Establishment of Roman Power in Britain.

13. John Garrett Underhill,
    Polytechnic Institute of Brooklyn, A.B., 1894.
    Columbia University, A.M., 1896.
    Major subject: Literature.
    Minor subjects: Philosophy; French Language and Literature.
    Dissertation; Spanish Literature in Elizabethan England.

14. Robert Sessions Woodworth,
    Amherst College, A.B., 1891.
    Harvard University, A.B., 1896; A.M., 1897.
    Major subject: Psychology.
    Minor subjects: Philosophy; Education.
    Dissertation: The Accuracy of Voluntary Movement.

II.—Master of Arts:

1. Louis Kaufman Anspacher,
    College of the City of New York, A.B, 1897.
    Major subject: Philosophy.
    Minor subjects: *European History; Political Philosophy.*
    Essay: A Comparison between Kant's Critique of Pure Reason and his Critique of Practical Reason.

2. Brenton Thoburn Badley,
   Ohio Wesleyan University, A.B., 1897.
   Major subject: Philosophy.
   Minor subjects: Psychology; Anthropology.
   Essay: The Principle of Measurement in Psychology.
3. Leroy Mason Beeman,
   Wesleyan University, A.B., 1895.
   Major subject: Education.
   Minor subjects: *History; Geography.*
   Essay: The Place of Emulation in Public School Work.
4. George Griswold Brower,
   Syracuse University, B.S., 1887; M.S., 1890.
   Major subject: Education.
   Minor subjects: Education; Anthropology.
   Essay: John Sturm's Contributions to Education.
5. Grace Lathrop Collin,
   Smith College, B.L., 1896.
   Major subject: Literature.
   Minor subjects: Literature; English.
   Essay: The Forty-Five Ballads of the Folio Manuscript Represented in Percy's Reliques—a comparison of the texts.
6. Ada Louise Comstock,
   Smith College, B.L., 1897.
   Major subject: Education.
   Minor subjects: English (Rhetoric); Literature.
   Essay: The Historical Development of Aim in the Teaching of the Mother Tongue.
7. Jasper Newton Deahl,
   Harvard University, A.B., 1893.
   Major subject: Education.
   Minor subjects: Education; English (Rhetoric).
   Essay: The Proper Organization and Instruction in Psychology in Normal Schools and in Training Schools.

8. Charles Bartlett Dyke,
   Leland Stanford Jr. University, A.B., 1898.
   Major subject: Education.
   Minor subjects: Philosophy; Education.
   Essay: Salaries of Teachers.
9. Lewis Einstein,
   Columbia College, A.B., 1898.
   Major subject: Literature.
   Minor subjects: Literature; *History*.
   Essay: Luigi Pulci.
10. Frederic Lowell Green,
   Massachusetts Agricultural College and Boston University, B.S., 1894.
   Major subject: Education.
   Minor subjects: Education; Psychology.
   Essay: Reviews.
11. Rose Bertha Gruening,
   Vassar College, A.B., 1895.
   Major subject: Music.
   Minor subjects: French Language and Literature; *Physics*.
   Essay: The Tendency of Modern Thought about Music.
12. Benjamin Rogers Howell,
   Wabash College, A.B., 1897.
   Major subject: Literature.
   Minor subjects: Literature; English.
   Essay: The Religious Drama of Calderon.
13. Reginald Hall Johnson,
   University of Wisconsin, A.B., 1896.
   Major subject: Literature.
   Minor subjects: Literature; French Language and Literature.
   Essay: Don Quixote and Sir Walter Scott.
14. Frederick Bird Jones,
   Colgate University, A.B., 1898.
   Major subject: Latin Language and Literature.

Minor subjects: Greek; Education.
Essay: The Influence of Terence on Molière.

15. Samuel Langer,
College of the City of New York, B.S., 1895.
Major subject: Education.
Minor subjects: Education; Hebrew.
Essay: Training for Citizenship in Asylums.

16. Jesse Albert Locke,
Columbia College, A.B., 1880.
Major subject: Literature.
Minor subjects: Literature; English.
Essay: The Use of Magic in Ariosto and Tasso.

17. John Ernest Magie,
College of the City of New York, A.B., 1898.
Major subject: Philosophy.
Minor subjects: English (Rhetoric); Hebrew.
Essay: The Problem of Perception in Epistemology.

18. Guy Everett Maxwell,
Hamline University, A.B., 1893.
Major subject: Education.
Minor subjects: Education; Psychology.
Essay: Correlation in the United States.

19. Caroline Tilden Mitchell,
Smith College, B.L., 1897.
Major subject: Education.
Minor subjects: *European History; Political Philosophy.*
Essay: History-teaching in Germany and America.

20. Susan Isabella Myers,
Columbia College, A.B., 1898.
Major subject: Greek Language and Literature.
Minor subjects: Latin; Literature.
Essay: The Praise of Athens.

21. Alice Jane Gray Perkins,
Columbia College, A.B., 1898.
Major subject: Latin Language and Literature.

Minor subjects: Roman Archæology; Greek.
Essay: Lucan the Sensationalist: An Empirical Sketch.

22. Sara Jay Phillips,
Vassar College, A.B., 1897.
Major subject: Literature.
Minor subjects: English (Rhetoric); Education.
Essay: The Amazonian Heroine in Literature.

23. Ellen Pyle,
Swarthmore College, A.B., 1892.
Major subject: Latin Language and Literature.
Minor subjects: Greek; Literature.
Essay: Roman Lack of Taste as Shown in Horace.

24. Elizabeth Fisher Read,
Smith College, B.L., 1896.
Major subject: German Language and Literature.
Minor subjects: German Language and Literature; Literature.
Essay: The Source of William Morris's Poem, "The Fostering of Aslang," in "The Earthly Paradise."

25. Evelina Carroll Simon,
Woman's College of Baltimore, A.B., 1898.
Major subject: Education.
Minor subjects: Education; *Physics.*
Essay: The Citizen and his Neighborhood.

26. John Walter Stephens,
Trinity University, A.B., 1893; Cumberland University, B.D., 1896.
Major subject: Philosophy.
Minor subjects: Anthropology; *Sociology and Statistics.*
Essay: The Relation of Motives to Character and Conduct.

27. Frederick Emerson Stockwell,
Brown University, A.B., 1890; Union Theological Seminary, B.D., 1898.

Major subject: Philosophy.
Minor subjects: *European History* (*Church History*); Greek.
Essay: The Psychology of Paul.

28. Aline Croquet Stratford,
Columbia College, A.B., 1897.
Major subject: Literature.
Minor subjects: French Language and Literature; English.
Essay: The Characterization of Women in the Romantic Epic.

29. Nathan Stern,
Columbia College, A.B., 1898.
Major subject: Semitic Language and Literature.
Minor subjects: Semitic Language and Literature; *Sociology and Statistics.*
Essay: Divination and Magic among the Jews.

30. Gregory Dexter Wolcott,
Brown University, A.B., 1897.
Major subject: Philosophy.
Minor subjects: Greek; Hebrew.
Essay: A History of the Bi-Partite and the Tri-Partite Divisions of Mental Phenomena.

31. Isaac Yohannan,
Columbia College, A.B., 1897.
Major subject: Semitic Language and Literature.
Minor subjects: Semitic Language and Literature; Iranian.
Essays: Syriac Church; The Rise and Growth of the Oriental Sects.

32. Mabel Minerva Young,
Wellesley College, A.B., 1898.
Major subject: Education.
Minor subjects: Education; Psychology.
Essay: The Aims and Methods of the Teaching of Mathematics in the Secondary Schools of Germany and the United States.

SCHOOL OF PURE SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the seventh annual report on the work of the Faculty of Pure Science. This report refers to the academic year ending June 30, 1899, and consists, first, of the report of the Dean, and secondly, of the reports of the heads of the departments represented in the Faculty.

The statistics of attendance in the School of Pure Science are embodied in the following detailed statement. Appended to this statement is a table giving a summary of the statistics of the School since its organization in 1892. The total number of students pursuing work either wholly or in part under direction of the School during the year was 194, an increase of 10, or about 5 per cent., over the corresponding number of the preceding year.

Number of students registered primarily under the Faculty of Pure Science:

Candidates for the higher degrees	44
Special students (not candidates for degrees)	29
	73

Number of students registered primarily under other Faculties of the University:

Candidates for the higher degrees:	
From Schools of Applied Science	14
" College of Physicians and Surgeons	18
" School of Philosophy	3
" Barnard College	17
	52

Number of students registered primarily under other Faculties of the University:

Special students (not candidates for higher degrees but pursuing graduate work):

From School of Philosophy	2
" School of Applied Science	11
" College of Physicians and Surgeons	11
" Columbia College	4
" Barnard College	9
	37

Number of Seniors pursuing elective subjects under Faculty of Pure Science:

From Columbia College	20
" Barnard College	12
	32

Total number of students under instruction in School of Pure Science	194

Table showing statistics of attendance in School of Pure Science since its organization in 1892:

	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8	1898–9
Graduate students registered in School of Pure Science	13	25	26	28	36	41	44
Graduate students registered in other Schools	3	4	5	8	18	46	52
Undergraduates from Columbia College	37	29	14	24	24	9	20
Undergraduates from Barnard College	....	....	....	....	9	14	12
Students from College of Physicians and Surgeons	....	....	3	8	22	17	11
Students from Schools of Applied Science	....	....	9	10	9	17	11
Special students (graduates and undergraduates	6	9	9	7	31	40	44
Totals	59	67	66	85	149	184	194

Of the graduate students registered primarily in the School of Pure Science, 20 hold the degree of A.B., 17 the degree of B.S., 4 the degree of E.M., 1 the degree of C.E., and 2 the degree of Ph.B. Twenty-one of these hold more than one degree, 14 holding the degree of A.M., 7 the degree of M.S., 4 the degree of M.D., 1 the degree of M.M.E., and 1 the degree of E.E.

Of the special students registered primarily in the School of Pure Science, 1 holds the degree of A.B., 4 the degree of B.S., 3 the degree of Ph.D., 3 the degree of M.D., and 3 the degree of Ph.G. Of the whole number of special students registered primarily in the School, 17 hold no degree.

Of the 96 graduate students pursuing work in the School of Pure Science, 19 come from Columbia University, while the remaining 77 come from 34 different institutions of 21 different States and foreign countries.

Of the entire number of students in the School, all but 24, or 12 per cent. of them, either held first degrees or received them at the commencement of this year.

The following table gives the names, dates, and designations of the first degrees and the institutions granting them, and the titles of the dissertations, of the candidates upon whom the degree of Doctor of Philosophy was conferred on the recommendation of the Faculty of Pure Science. The number of such candidates is 14. The average number of years for these candidates elapsing between the time of attainment of the first degree and the time of attainment of the higher degree is seven and one-half years, the shortest interval being three years and the longest twenty years.

Candidate	Title of Dissertation
Edward Sandford Burgess, A.B., Hamilton College, 1879; A.M., 1882.	Studies in the Genus Aster.
Henry Edward Crampton, Jr., A.B., Columbia College, 1893.	The early history of the egg in Molgula manhattensis.
Elmer Wallace Firth, C.E., Cornell University, 1895; A.M., Columbia University, 1898.	Micro-organisms in the air of public buildings and conveyances, due to improper methods of cleaning.
John Duer Irving,	Some eruptive rocks of the northern

Candidate	Title of Dissertation
A.B., Columbia College, 1896; A.M., Columbia University, 1898.	Black Hills and their Associated Ore-bodies.
Smith Ely Jelliffe, A.B., Brooklyn Institute, 1896; M.D., Columbia University, 1889.	The Flora of Long Island.
Edward Kasner, B.S., College of the City of New York, 1896; A.M., Columbia University, 1897.	The invariant theory of the inversion group.
Walter Coluzzi Kretz, A.B., Columbia College, 1896; A.M., Columbia University, 1897.	Positions and proper motions of the principal stars of the cluster in Coma Berenices as Deduced from measurements of the Rutherfurd photographs.
James Howard McGregor, B.S., Ohio State University, 1894; A.M., Columbia University, 1896.	Spermatogenesis in Amphiuma.
James Maclay, C.E., Columbia University, 1888.	Double minimal surfaces whose minimal curves have two points on the infinitely distant circle.
Frederick John Pope, A.M., Queen's University, 1891.	Investigation of magnetic iron ores from eastern Ontario.
George Albert Soper, B.S., Rensselaer Polytechnic Institute, 1895; A.M., Columbia University, 1898.	Purification of drinking water by the use of ozone.
Theodore Greely White, Ph.B., Columbia University, 1894; A.M., 1895.	The Black River, Trenton, and Utica formations in the Champlain valley of New York and Vermont.
Harriet Winfield, A.B., Wellesley College, 1887; A.M., Columbia University, 1896.	The oil of maize.
John Francis Woodhull, A.B., Yale University, 1880.	The teaching of physics in secondary schools.

The following table gives the names, the dates, and designations of the first degrees and the institutions granting them, and the titles of the essays, of the candidates upon whom the degree of Master of Arts was conferred on recommendation of the Faculty of Pure Science. The number of such candidates is 19. The average time interval for these candidates elapsing between the times of attainment of the first and higher degree is four years, the shortest interval being two and the longest nine years. Of the candidates mentioned in this list, six were simultaneously candidates for the degree of M.D., and two for the degree of E.E.

Candidate	Title of Essay
Grace Andrews, B.S., Wellesley College, 1890.	Isothermal systems of plane curves.
Charles Howard Burnside, M.S., Penn College, 1896 ; B.S., Columbia University, 1898.	History and theory of moments of inertia.
Clara Maria Burt, B.S., Wellesley College, 1892.	Caffeine and its determination in coffee.
William Merriam Cobleigh, E.M., College of Montana, 1894.	Iodine and bromine absorption—Numbers of fats and oils.
Louise Brisbin Dunn, A.B., Columbia University, 1897.	Notes on the embryo sac of Delphinium Exaltatum. Ait.
Haven Emerson, A.B., Harvard University, 1896.	The structure of Nitella and the effect of external stimuli upon its protoplastic material.
Albert Rolaz Gallatin, A.B., Columbia College, 1891 ; E.E., Columbia University, 1898.	Theorems relative to the sphere in the theory of the potential function.
Everett Willoughby Gould, A.B., Columbia College, 1896.	The form of the muscle curve in the frog.
Carl Gundersen, A.B., Leland Stanford Jr. University, 1897.	The existence theorem of ordinary differential equations for real variables.
Tracy Elliot Hazen, A.B., University of Vermont, 1897.	The life history of Sphærella Lacustris.
Henry St. John Hyde, Ph.B., Columbia University, 1897.	A comparison of methods for the determination of Phosphoric Acid.
Henry Stoddard Lyman, A.B., Yale University, 1892.	The effect of temperature upon the contraction of the lobster's heart.
William McDonald, Jr., Ph.B., Brown University, 1895.	The Mesencephalon.
Joseph Warren Miller, Jr., B.S., Pennsylvania State College, 1897.	A brief summary of the history of the principal methods for the determination of the acceleration of gravity.
Edward Delavan Nelson Schulte, B.S., Trinity College, 1897.	Investigation of the core losses of a transformer.
Hewlett Scudder, Jr. A.B., Yale University, 1896.	Investigation of the core losses of a transformer.
George Linius Streeter, A.B., Union College, 1895.	Development of the Prosencephalon.
Sherburne Frost Taylor, B.S., Cornell University, 1897.	Citraconic, mesaconic, and itaconic acid and derivatives.
Linsly Rudd Williams, A.B., Princeton University, 1895.	The effect of heat and cold upon the rate of beat of the lobster's heart.

The distribution of the courses of study in the departments of the School and the number of courses given during the past year are set forth in abstract in the following table. For details, however, of the work presented in the past academic year, reference must be made to the departmental reports which follow:

Department	Number of Courses Offered		Number of Courses given 1898–99
	Graduate	Collegiate	
Anatomy,	16	4	15
Astronomy,	4	3	6
Bacteriology,	2	—	2
Botany,	7	8	11
Chemistry,	17	9	23
Geology,	8	8	6
Mathematics,	11	8	14
Mechanics,	17	2	12
Mineralogy,	8	3	8
Physics,	30	1	16
Physiology,	4	—	4
Zoölogy,	12	3	9
Totals,	136	49	126

In addition to the courses included in the above list, three courses in anthropology were given by Dr. Franz Boas, Lecturer in Anthropology.

Attention is respectfully invited to the departmental reports for interesting details concerning the varied scientific activities of the academic staff, of Fellows, of Scholars, and of the graduate students of the School. These details refer to the work of instruction, to original researches and publications, to field explorations, to departmental equipments, needs, etc.

Amongst the pressing needs of the School, the most important are the two following, which are here merely stated without elaboration or discussion, namely:

First, additional equipment and funds for the prosecution of advanced work of research.

Second, additional facilities for the prompt publication of meritorious investigations, such as dissertations and essays of graduate students.

Referring to the departmental reports for details of acknowledgment, mention may be made here of the admirable gifts of Miss Catherine W. Bruce to the Department of Astronomy, of Mr. Charles H. Senff to the Department of Zoölogy, of Mr. Albert R. Gallatin to the Department of Mechanics, and of Miss Susan Dyckman's foundation for a Scholarship in Zoölogy.

An academic event of the year of unusual interest, in which Columbia was invited to participate, was the celebration by the University of Cambridge of the fiftieth anniversary of the Lucasian Professorship of Sir George Gabriel Stokes, Bart., on June 1 and 2, 1899. The Dean of the Faculty of Pure Science was delegated to represent Columbia on this jubilee occasion and to bear the greetings of the Trustees, the President, and the Academic Staff to the eminent man whose works, like those of the renowned Newton and Maxwell of the same institution, have distinguished an important epoch in the progress of the mathematico-physical sciences.

Very respectfully submitted,

R. S. WOODWARD,

Dean.

REPORTS OF DEPARTMENTS

DEPARTMENT OF HUMAN AND COMPARATIVE ANATOMY

Professor GEORGE S. HUNTINGTON

1. Educational Staff.

No changes have taken place in the educational staff of the Department during the current year.

The plan of annually appointing a number of the older undergraduates as student demonstrators in Anatomy has now been in operation for two years. The results have been very satisfactory. This increase in the teaching force is of great value in conducting the practical anatomical work during the evening sessions.

2. Courses.

The usual practical and didactic courses of the medical curriculum have been given during the year.

The additional cold storage rooms erected last year for the collection and preservation of anatomical material during the summer months made it possible to materially raise the required standard of the practical anatomical work during the present session.

A system of recitations was introduced for the first time this year in connection with Course I. The Department is of the opinion that this form of instruction is destined to become a valuable part of the anatomical course.

A considerable number of new optional courses in Human and Comparative Anatomy were offered this year under the Faculty of Pure Science.

The attendance on these courses was unusually large, both on the part of the candidates for the higher University degrees and of medical undergraduates electing additional courses as optional work.

3. Museum and Research.

Undergraduate courses of instruction have received valuable additions.

It is a matter of profound regret that the insufficient equipment of the anatomical building in the matter of museum cases not merely prevents the serial exhibition which makes the museum an educational factor of the first importance, but also entails loss and deterioration in preparations which will be difficult and costly to replace in the future. The Department earnestly recommends the acquisition of sufficient cases to provide at least for the safe storage of the collection.

During the last week in December the Association of American Anatomists met at Columbia University in conjunction with the affiliated scientific societies.

The following papers were presented at this meeting by officers of the Department:

G. S. Huntington—"Morphology and Phylogeny of the Vertebrate Ileo-Colic Junction."
"On the Cerebral Fissures and the Visceral Anatomy of the Eskimo from Smith's Sound."
"Visceral and Vascular Variations in Human Anatomy."
"Contribution to the Anatomy of the Reptilian Vascular System."
"The Sternalis Muscle."
"Genito-Urinary System of the American Pit-Vipers."
Jos. A. Blake—"Development and Structure of the Metencephalon."
W. K. Martin—"Examination of the Cæcum and Appendix in 100 subjects."
Geo. E. Brewer—"Surgical Relations of the Duodenal Orifice of the Common Bile-Duct."

Dr. A. Hrdlicka also presented a paper on the normal human Tibia, based on extensive researches carried on during the past two years in the osteological reference collection of the Department.

The Association, in response to a request received from the English Editors of the *Journal of Anatomy and Physiology*, nominated Professor Huntington as American Editor of the Journal.

Professor Huntington was appointed to represent the Association in the joint discussion of the Affiliated Societies on the "Advances in Methods of Teaching," held in Schermerhorn Hall on the afternoon of December 30th.

Dr. Blake represented the Department in the Annual Exhibition of the New York Academy of Sciences, taking charge of the anatomical section.

4. Library.

The Departmental Library received a second valuable gift of anatomical works from Dr. F. H. Markoe of this city. A number of volumes have been added by purchase during the year, and the collection is of great practical value in direct connection with the laboratory and research work of the Department.

5. Work of Fellow in Anatomy.

Dr. Blake, the present incumbent of the Alumni Association Fellowship, has concluded a very interesting and important series of investigations on the structure of the Metencephalon. The results of this valuable research were presented to the Association of American Anatomists at the last meeting and are to be published shortly in the *Journal of Comparative Neurology.*

Dr. Blake was reappointed to the Fellowship and will undertake during the coming academic year a research on the structure and development of the Mammalian lung.

DEPARTMENT OF ASTRONOMY

Professor J. K. Rees

1. Educational Staff.

John Krom Rees, Ph.D., Professor of Astronomy and Director of the Observatory.
Harold Jacoby, Ph.D., Adjunct Professor of Astronomy.
Herman Stearns Davis, Ph.D., Tutor in Astronomy.
George W. Hill, LL.D., Lecturer on Celestial Mechanics.

Charles Derleth, C.E., and W. C. Kretz, A.M., assisted in the Summer School of Practical Geodesy during six weeks of the summer of 1898.

By the aid of funds contributed by Rutherfurd Stuyvesant, Esq., and Miss Catherine W. Bruce, I have been able to retain the services of

F. E. Harpham, A.B., Chief Computer.
E. Magill, A.B., Computer.
M. E. Tarbox, A.B., Computer.

Dr. H. S. Davis resigned as Tutor on June 15th, and S. A. Mitchell, Ph.D. (Johns Hopkins University), Fellow at the Yerkes Observatory, has been appointed Tutor in Astronomy from July 1, 1899.

The University was able to secure the services of Dr. Hill as Lecturer on Celestial Mechanics because of the liberal gift of Miss Bruce of five thousand dollars for the special object of obtaining Dr. Hill's course of lectures.

2. *University and Other Courses.*

Instructors	Courses	Hours per Week	Students
Prof. Rees assisted by Dr. Davis	Astronomy I General Astronomy	2 and Conferences at Observatory	2 Graduates 3 Seniors 2 Juniors 1 Sophomore 4 Barnard Seniors 1 Auditor
Dr. Davis	Astronomy II Practical Astronomy	2 with Observatory work	4 Graduates A.M.
Prof. Rees Prof. Jacoby	Astronomy III Geodesy 3d year Civil Engineers	2	14 C.E.
Prof. Rees Prof. Jacoby	Astronomy III (continued) Geodesy 4th year Civil Engineers	2 one term	11 C.E.
Prof. Jacoby with Assistants	Astronomy III Summer School in Geodesy, June 1 to July 12, 1898	50 for six weeks	10 C.E.
Prof. Jacoby	Astronomy VI Reduction of Photographic Star Plates	1 and conferences	3 Graduates Ph.D.
Dr. George W. Hill	Astronomy VIII Lectures on Celestial Mechanics	1	2 Graduates Ph.D.
Dr. George W. Hill	Astronomy IX Advanced Course in Celestial Mechanics	1	1 Graduate Ph.D.

3. Walter Coluzzi Kretz, A.M., held the Fellowship in Astronomy this year. He received on June 7th the degree of Ph.D. His dissertation was on "Positions and Proper Motions of the Principal Stars of the Cluster in Coma Berenices as Deduced from Measurements of the Rutherfurd Photographs." Dr. Kretz's paper will be published in the *Annals of the New York Academy of Sciences.*

4. Professor Rees and Dr. Davis have continued the observations for Variation of Latitude and the Constant of Aberration. Professor Jacoby has devoted much time to the study of photographic researches near the pole of the heavens, and Dr. Davis has given all his spare time to the re-reduction of Piazzi's catalogue.

Publications:

Prof. John Krom Rees. Some facts about the minor planets. *Popular Astronomy*, August, vi., 339–345.—Large refractors of the world. (A correction.) *The Observatory*, December, xxi., 450.—The variation of latitude at New York, and a determination of the constant of aberration from observations at the observatory of Columbia University. (With Prof. Jacoby and Dr. Davis.) Second paper. *The Astronomical Journal*, December 12, xix., 149–151.

Prof. Harold Jacoby. Photographic researches near the pole of the heavens. *Bulletin Imperial Academy of Sciences of St. Petersburg*, ix., 41–82.—Variation of latitude at New York, and a determination of the constant of aberration. (With J. K. Rees and H. S. Davis.) *Astronomical Journal*, xix., 149–151.

Dr. Herman S. Davis. A catalogue of sixty-five stars near 61^1 Cygni. *Contribution No. 12 from the Observatory of Columbia University*, April.—The parallaxes of 61^1 and 61^2 Cygni. *Contribution No. 13 from the Observatory of Columbia University*, April.—Remark regarding the parallaxes of 61^1 and 62^2 Cygni and the probable physical connection of these two stars. Read at the Astronomical Conference, Harvard University, August. Résumé in *Astrophysical Journal*, November, viii., 246, 247; *Popular Astronomy*, November, vol. vi.—A catalogue of thirty-four stars near "Bradley 3077." *Contribution No. 14 from the Observatory of Columbia University*, April.—A review of The Concise Knowledge Library — Astronomy. *Popular Astronomy* May, vi.,—Women astronomers: biographical sketches and review of Rebière's Les Femmes dans la Science, *Popular Astronomy;* first article, 400 A.D. to 1750, May, vi., 129–138; second article, 1750–1890, June, vi., 211–220; third article, contemporary, June, vi., 220–228. — Deterioration of celluloid films for photographic purposes. *Science*, August 5, viii., 163.—Outline of the history of astronomy. *Popular Astronomy*, October, vi., 455–459.—The variation of latitude at New York and the determination of the constant of aberration, from observations at the observatory of Columbia University (with Profs. Rees and Jacoby). *Astronomical Journal*, December, xix, 149–151.

Dr. George William Hill. Observations on Prof. Newcomb's determination of the principal element of precession. *Astronomical Journal*, xviii., 153.—Correction to preceding article. *Astronomical Journal*, xviii., 168.—Note on the mass of mercury. *Astronomical Journal*, xix., 157.

5. The Summer Class in Practical Geodesy continued the geodetic survey near Osterville, Mass., from June 1st to July 12th. The class was in charge of Professor Jacoby assisted by Messrs. Derleth and Kretz. The work done is indicated on the enclosed printed scheme.

6. Since the sale of the old site we have had no observatory except the zenith telescope and transit houses now erected at the new site. The 13-inch equatorial and other instruments are stored in the basement of Fayerweather Hall. We need, and at once, generous gifts to enable this University to put up a new observatory and to place in it instruments of the latest designs. This crying need of the University should be kept before the public. New York City is the only large city in the United States which has no observatory. It is the city that owes the greatest debt to astronomy because of what astronomy has done for navigation.

The department needs also new instruments for its geodetic work. Most of our instruments are nearly twenty years old. We ought to have the latest forms of base-measuring apparatus and angle-measuring theodolites. Your intimate knowledge of these matters will make you, I am sure, appreciate the importance of these statements.

7. Rutherfurd Stuyvesant, Esq., has continued his generous gifts to aid in the Rutherfurd Reductions.

Miss Catherine W. Bruce of New York City has again proved herself a great and liberal friend. During this year Miss Bruce has sent us $1500 for computers' salaries; $2500 for a fixed polar telescope to be mounted at Helsingfors, Finland; $10,000 for carrying on the reductions and measurements of astronomical photographs.

We give below the funds obtained by me during the past eight years:

Lewis M. Rutherfurd	$ 1,475
Rutherfurd Stuyvesant	6,350
F. Augustus Schermerhorn	1,000
J. H. Ladew	200
S. D. Coykendall	100
Mrs. Hermann	100
Miss Catherine W. Bruce	22,100
Several small donations	250
Total received in the last eight years	$31,575

Professor Jacoby's researches by photography of the stars immediately surrounding the north pole of the heavens have now progressed far enough to make the ultimate success of the undertaking tolerably certain. It has therefore seemed desirable to go to the trouble and expense of having a special polar telescope constructed, so that the photographic observations may be effected under the most favorable possible conditions. Miss Bruce, with her usual generosity to astronomical science, has contributed a sum sufficient to make the proposed instrument practically possible. For the better elimination of the effects of atmospheric refraction, it is best that photographs for the present purpose be made at some point on the earth near the terrestrial pole. The most convenient available station is the observatory at Helsingfors; and negotiations are now completed with the Russian authorities which will soon lead to the actual carrying out of Professor Jacoby's new plan. Once the necessary photographs are secured, they can be brought to New York for measurement and computation. The Columbia observatory already possesses two measuring machines by Repsold of Hamburg, and for the computations has the efficient assistance of Misses Harpham, Magill, and Tarbox.

All the papers published on the Rutherfurd stellar photographs have been collected in one volume of 614 pages. The edition is very small, and will be distributed to a few observatories especially interested in the work.

The Trustees of the University have erected on the Green, near the corner of 120th Street and Broadway, a little building to be used for housing a transit instrument for time determinations.

Frank Schlesinger, Ph.D. (Columbia, 1898), has accepted from the Superintendent of the United States Coast and Geodetic Survey, Dr. H. S. Pritchett, an appointment as observer at Ukiah, California. Dr. Schlesinger becomes one of the observers in the international scheme for the determination of variation of latitude.

DEPARTMENT OF BACTERIOLOGY

Professor T. MITCHELL PRUDDEN

One course of instruction in Bacteriology and Bacteriological Technique—University Course 2—has been given by Dr. T. M. Cheesman, Instructor in Bacteriology, during the year ; one of the three attendants upon this having been a candidate for a higher University degree. One candidate for a higher University degree has, under the direction of Dr. Prudden, pursued University Course No. 3 adapted to the biological aspects of Sanitary Engineering. The research work of the Department and its publications for the year, which especially concern the relationships of bacteria and other micro-organisms to disease, are included in the report to the Dean of the Medical Faculty.

DEPARTMENT OF BOTANY

Professor LUCIEN M. UNDERWOOD

The staff of the Department has been slightly changed during the year by the resignation of Dr. J. K. Small as Curator to take effect Jan. 1, 1899, he having been called to a similar position at the New York Botanical Garden. Dr. Marshall Avery Howe has been appointed to the position thus left vacant. This change has been specially advantageous to the Department ; Dr. Small has rendered admirable service as Curator, while Dr. Howe excels in the matter of giving instruction ; the transfer of the collections to Bronx Park renders the duties of Curator less arduous, while the largely increased undergraduate work demands that there be an addition to the force of instruction. Dr. Howe brings to the Department a wide experience gained while Instructor in Botany at the University of California, a position he held four years before entering on his course of graduate work at Columbia.

Dr. C. C. Curtis, Tutor in Botany, spent the summer of 1898–9 at the laboratory of Professor Pfeffer in Leipzig, and during the year has rendered most excellent service to the Department.

During the year the following courses have been offered with the following attendance:

Course I	17	Collegiate courses.
Course II	3	
Course III	6	
Course IV	2	
Course V	4	
Course VI	3	
Course VII	6	
Course VIII	45	

In every course a considerable increase over 1897–8.

Course X	4	University courses.
Course XI	1	
Course XIV	4	

The Fellow in Botany, Mr. Tracy E. Hazen, has continued his researches among the fresh-water Algæ, in one of the families of which he has chosen his thesis. He has published during the year a valuable contribution to science on the life history of *Sphærella lacustris*, an organism specially valuable for a laboratory subject in general elementary biology, since its growth can be easily regulated for class study.

Other researches have been carried on in the laboratory and herbarium. Dr. Small has brought nearly to completion his researches on the Flora of the Southern States, which will be sent to the printer the present year; Dr. Howe has published his thesis on the Hepaticæ and Anthocerotes of California, forming the handsome volume seven of the *Memoirs of the Torrey Botanical Club* with thirty-five plates; the theses of Dr. Rydberg on the Potentilleæ of North America and that of Dr. Jelliffe on the Flora of Long Island have been printed during the year; Professor Lloyd has been carrying on a series of studies in the embryology of the Rubiaceæ; Mr. Griffiths, University Scholar in Botany, has commenced a series of studies in the development of some of the higher fungi, that already promise valuable results; Professor Burgess has completed his studies of the genus

Aster, which forms his thesis for the doctorate and which has been accepted for publication as volume nine of the *Memoirs of the Torrey Botanical Club*. Other investigations have been carried on by various members of the staff ; some have already been published as noted below, and others are as yet incomplete.

The sixth volume of the "Contributions from the Department of Botany of Columbia University" has been completed with the distribution of numbers 126–150 ; this aggregates 348 octavo pages with 18 plates ; volume seven has also been advanced as far as No. 158. These papers have been prepared by the following contributors : L. M. Underwood (4), C. C. Curtis (1), J. K. Small (5), M. A. Howe (3), F. E. Lloyd (2), E. G. Britton (1), A. M. Vail (3), E. P. Bicknell (5), G. V. Nash (4), A. J. Grout (1), E. O. Wooton (2), D. Griffiths (2).

The second volume of the *Memoirs* of the Department of Botany has been issued during the year ; it contains Dr. Rydberg's valuable monograph of the Potentilleæ, and forms a quarto of 224 pages and 112 plates.

The theses of Dr. Howe and Dr. Jelliffe, and the Memoir by Mr. Hazen, have already been mentioned in this report.

The publications of the Torrey Botanical Club have been as heretofore edited by members of the staff and these publications not only furnish opportunity for ready publication of the results of research, but at the same time secure to the botanical library very valuable returns in the extensive exchanges received.

The agreement adopted by the Trustees of the University and the Managers of the New York Botanical Garden have made possible a great extension of the facilities for research work, and the combined staff of the University and the Botanical Garden is enlisted in offering a much wider and more satisfactory range of research courses than has hitherto been possible. Arrangements are all perfected for the transfer of the botanical library and collections to Bronx Park during the summer vacation, and the graduate work will be transferred to the elegant new Botanical Museum now approaching completion ; it has been arranged for the graduate work to commence at the Bronx in October, 1899. While this transfer affords needed space for the increasing undergraduate work in Schermerhorn Hall, it also involves some problems of supervision that only time can satisfactorily adjust. A tentative scheme has been adopted for the academic year 1899–1900 that will permit each member of the staff to have a consecutive portion of his time free for research work at the Botanical Garden and yet leave the Department at the University manned each day in the week ; it is believed that in this way the interests of the University will be best conserved, both in extending the interest in undergraduate work and in encouraging research on the part of every member of the staff. The collections at the Botanical Museum will prove an undoubted stimulus to botanical study among the undergraduate students in the Department so soon as they shall be open for study and consultation.

There is need of a closer correlation of work in Botany in the three divisions of the University—the Columbia Department of Botany, Barnard College, Teachers College, all of which give undergraduate instruction in the subject. This is necessary (1) To prevent undue duplication of work, (2) To allow the greatest possibility of time for research on the part of the respective boards of instruction, and (3) To economize in the matter of equipment and apparatus. A proposition regarding this matter is already in the hands of the President.

The question of a suitable greenhouse for the use of the Department, where stock plants for experimentation can be properly grown, will need to be considered by the University in the near future. The old structure that has temporarily served this purpose is a poor makeshift and does not supply our needs. It would seem as though this matter might be considered in connection with the matter of a general house for growing such plants as are needed for ornamental purposes at the University and be made an ornamental feature of the quadrangle. In addition to this, we need the completion of the equipment of the small room off the Physiological Laboratory for which detailed plans are in the hands of the Superintendent of Buildings and Grounds. This is very essential to the accomplishment of satisfactory work in plant physiology, which demands a more constant temperature and moisture than present arrangements will permit.

The removal of the herbarium cases from the general laboratory room will also necessitate additional cases for that room. In this matter we would call attention to the fact that the original requisition for furnishing this room called for cases with 96 exhibition spaces, while those furnished supply only 64. The addition of two cases similar to those now in the room will make it more possible to evenly exhibit typical forms from the entire range of plant life and at the same time will supply the need for filling the vacancy left by the removal of the general herbarium cases.

During the year the increase of students necessitated the purchase of a considerable number of new microscopes and other apparatus; a new projection apparatus has been added to the lecture room and has thus added materially to our facilities for the illustration of lectures, since without it our large stock of lantern slides was practically useless. A Leitz projection apparatus has also been supplied for assistance in delineation. Numerous additions have been made to the collections during the present year; notable among these is the completion of valuable series of *Algæ exsiccatæ*, which has placed our collection in this division of plants on a par with our other collections. Naturally the larger additions to the collections will be continued through the Botanical Garden, so that hereafter we shall look to that source for supplying facilities for taxonomic work additional to the extensive collections that have already been accumulated by the University. The presentation of a series of Bahama plants collected by the late J. I. Northrup should be noted among the important accessions of the year.

DEPARTMENT OF CHEMISTRY

Professor C. F. CHANDLER

(See report of this Department in report of Dean of Faculty of Applied Science.)

DEPARTMENT OF GEOLOGY

Professor J. F. Kemp

1. Educational Staff.

This has consisted of J. F. Kemp, Professor; Alexis A. Julien, Instructor and Curator; Arthur Hollick, Tutor; Gilbert van Ingen, Curator.

No changes in personnel were made during the year.

2. University Courses Given and Attendance on Each.

Geology III. Economic Geology:

1 Graduate, candidate for M.A.
3 Special students.
17 Third-year Students from the School of Mines.
11 Fourth-year " " " " " "

Geology VII. Paleontology (not offered in 1898–99, but given by special request):

3 Graduates, candidates for M.A. and Ph.D.

Geology VIII. Comparative Geology:

2 Graduates, candidates for M.A. and Ph.D., taking this as part of major.

Geology IX. Paleobotany:

1 Graduate, candidate for Ph.D., taking this as a minor.

Geology I. General Geology:

11 Undergraduates:
  5 Juniors from Columbia College.
  4 Seniors " " "
  2 Third-year students, School of Mines.

Geology II. General Geology:

39 Undergraduates and graduates, candidates for technical degrees:
  15 Third-year Civil Engineers.
  19 Second-year Mining Engineers.
  5 Specials.

3. The Fellow in Geology has been John Duer Irving, M.A. During the summer of 1898 Mr. Irving was in the Black Hills of South Dakota, preparing his thesis for Ph.D. He passed June, July, August, September, and part of October in this work, and collected a large suite of specimens, which were shipped back to the University. During the year he has completed his thesis, which has been presented and has been accepted for printing in the *Annals of the New York Academy of Sciences*, vol. xi. It is entitled "A Contribution to the Geology of the Northern Black Hills of South Dakota." Mr. Irving received his Ph.D. at Commencement, and has accepted a position on the U. S. Geological Survey.

4. Researches and Publications of the Department. Professor Kemp continued the work of previous years upon the geology of the eastern Adirondacks, both for the U. S. Geological Survey and the N. Y. State Survey. The former will require another season to complete; but the latter admitted of a preliminary report, which has been sent to Albany to the State Geologist. It treated especially the crystalline rocks of Washington and Warren counties. A paper on the "Granites of Southern Connecticut and Rhode Island" was presented to the Geological Society of America at their meeting in New York, December, 1898, and has been accepted for publication in the *Bulletin* of the Society. Kemp's *Ore Deposits of the United States* has been practically rewritten and enlarged for a third edition.

An extended paper by Dr. Julien on the "Elements of Strength and Weakness in Building Stones" is in press in the *Journal* of the Franklin Institute.

Dr. Hollick's work on "The Relation between Forestry and Geology in New Jersey," prepared for the Geological Survey of that State, was presented before the Botanical Society of America at the Boston meeting and was subsequently embodied in a paper which was published in the *American Naturalist*, xxxiii., pp. 1–14, and 109–116, with a map. The continuation of his studies in the geology of the coastal plain region resulted in a paper read before the Geological Society of America, at the Boston meeting, on "Some Features of the Staten Island Drift," which was published in abstract in the *Bulletin of the Geological Society of America*, x., pp. 2–4. The same paper, more fully elaborated and illustrated, was subsequently read before the New York Academy of Sciences and is now in press in the *Annals* of the Academy. An illustrated description of "A New Tertiary Fossil Moss," written in connection with Mrs. N. L. Britton, was published in the *Bulletin of the Torrey Botanical Club*, xxvi., pp. 80, 81. Another important contribution to fossil botany was "Additions to the Paleobotany of the Cretaceous Formation on Staten Island, No. II.," which was published in the *Annals of the New York Academy of Sciences*, xi., pp. 415–430, pls. xxxvi.–xxxviii.

Dr. Hollick made a reconnoissance of the little-known Elizabeth Islands last summer and also spent about two weeks on Chappaquidick Island, Martha's Vineyard, with the special object of tracing the eastward extension of the Cretaceous formation in that region. An account of his trips through the Elizabeth Islands was presented at the May meeting of the New York Academy of Sciences and will be published in the *Annals*. A considerable amount of interesting material, demonstrating the presence of Cretaceous strata, was collected on Chappaquidick Island, which is now being subjected to critical examination. This material demonstrates the existence of the Cretaceous formation at a point farther east than it had previously been recorded.

During the month of May Dr. Hollick was invited by the Maryland Geological Survey to join in an expedition for an exploration of the region along Chesapeake Bay, with the special object of collecting fossil plants, in regard to which little was known. A considerable number were obtained, which will be studied and reported upon for the Survey. On the same expedition a large amount of Miocene and Pleistocene invertebrate fossils were collected, which will become the property of the Geological Department of the University.

Dr. Hollick is also preparing a paper on a collection of fossil plants from the Eocene of Louisiana, for a forthcoming report of the Geological Survey of that State.

Mr. van Ingen's investigations upon the Niagara fossils from Arkansas have developed so many and such unique forms that it has not been possible to properly complete the paper. It is expected that it will be done during the vacation of 1899. Mr. van Ingen has also been investigating some interesting fossil crabs from the Cretaceous of New Jersey.

Mr. T. G. White has completed his thesis for Ph.D. upon "The Black River, Trenton, and Utica Formations in the Champlain Valley of New York and Vermont," and it has been accepted for publication in the *Annals of the New York Academy of Sciences.* Mr. White will receive his degree at the approaching Commencement.

Mr. B. F. Hill, Scholar in Geology, spent the two months of December and January last in Sonora, Mexico, collecting materials for his thesis for Ph.D, in 1900, and has his notes partially in order. A paper on the "Petrography of Certain Crystalline Rocks from Wyoming" will appear in the *School of Mines Quarterly* for July, 1899.

5. Field-work of Officers of the Department. This topic has been largely covered under the preceding head. Professor Kemp spent a week in June, 1898, at Ducktown, Tenn., studying the great copper veins of the district and will prepare a short paper upon the paragenesis of the minerals. In the early part of July he conducted the Summer School of Geology in the James River Valley, and on the 25th took up field-work in the Adirondacks for the U. S. Geological Survey. The work was continued through September. He was assisted by F. J. Pope, graduate student. He also had in charge field-work for the N. Y. State Survey in eastern Hamilton and western Warren Cos., which was performed by B. F. Hill, Scholar in Geology, and D. H. Newland, formerly Fellow. For details of Dr. Hollick's field-work, see previous topic.

Mr. van Ingen was busied with his investigations at the University except for a short field-trip to Rochester, N. Y.

6. Recommendations. The undersigned again emphasizes the need of strengthening the Department along the lines of Physical Geography, and hopes for the early appointment of an officer to take special charge of that work.

In Paleontology and Stratigraphical Geology there is room for an adjunct professor, and ultimately for a separate department.

DEPARTMENT OF MATHEMATICS

Professor J. H. VAN AMRINGE

I submit herewith my report on the Department of Mathematics for the academic year 1898–99, so far as the operations of the same are related to the School of Pure Science.

1. The staff of the Department during the past year has been as follows:

J. H. VAN AMRINGE, Ph D., L.H.D., LL.D.,	Professor and Head of Department.
THOMAS S. FISKE, Ph.D	Professor.
FRANK N. COLE, Ph.D	Professor.
JAMES MACLAY, C.E., Ph.D	Instructor.
J. BRACE CHITTENDEN, Ph.D	Tutor.
CASSIUS J. KEYSER, A.M	Tutor.
WALTER WHEELER COOK, A.B	Assistant.
HENRY BEDINGER MITCHELL, E.E	Assistant.

2. The following is an account, in tabular form, of the courses, number, and subjects, by whom given, and by how many attended:

COURSES AND ATTENDANCE

Instructors	Courses	Hours per Week	Students	Total
	(Number and subject as in Catalogue 1898–99)			
Prof. Fiske	XXI. Advanced Calculus	3	4 A.M. and Ph.D. 1 Senior	5
Mr. Maclay	XXII. Differential Equations	3	3 A.M. and Ph.D. 1 Senior	4
Prof. Cole	XXIV. Riemann's Theory of Functions, including Elliptic Functions	3	4 A.M. and Ph.D.	4
Mr. Keyser	XXVI. Higher Plane Curves	3	3 A.M. and Ph.D.	3
Prof. Fiske	XXVIII. Theory of Abelian Functions	3	3 Ph.D.	3
Prof. Cole	XXX. Theory of Linear Transformations and the Higher Theory of Equations	3	1 Ph.D.	1

In addition to the courses noted above, the Department has given eight undergraduate courses in the College and the Schools of Applied Science.

3. Meetings attended by the instructors and university students of the Department were held at intervals of about two weeks throughout the year. At them, lectures, reports, or essays upon previously assigned topics were presented by the students. Lectures were also occasionally delivered by the instructors. The following subjects were treated:

I.	History of the Theory of Minimal Surfaces	Mr. Maclay.
II.	Systems of Geometry Considered as Invariant Theories	Mr. Kasner.
III.	Elements of the Theory of Groups	Prof. Cole.
IV.	Ancient and Modern Solutions of the Tangency Problems of Apollonius	Dr. Chittenden.
V.	Isothermal Systems of Plane Curves	Miss Andrews.
VI.	The Existence Theorem of Ordinary Differential Equations for Real Variables	Mr. Gundersen.
VII.	Dedekind's Definition of the Irrational Number	Miss Duer.
VIII.	The Invariant Theory of the Inversion Groups	Mr. Kasner.

4. The following is a list of the mathematical publications of the members of the Department during the year:

PUBLICATIONS

Prof. F. N. Cole—Reports of Meetings of the American Mathematical Society, *Bulletin of the American Mathematical Society*, vol. v., pp. 1–13, 113–120, 217–222, 325–334; *Science*, vol. viii., pp. 362, 363, 717; vol. ix., pp. 57–58, 322–323, 684–685.—Review of Burnside's Theory of Groups, *Science*, vol. ix., pp. 106–109.

Dr. J. B. Chittenden—Review of F. N. Willson's Theoretical and Practical Graphics, *Bulletin of the American Mathematical Society*, vol. v., pp. 353–357.

Mr. C. J. Keyser—"On a Definitive Property of the Covariant," *Bulletin of the American Mathematical Society*, vol. v., pp. 468–470.—Review of W. B. Smith's Infinitesimal Analysis, *Science*, vol. ix., pp. 844–846.—Review of G. W. Evans's Algebra for Schools, *Science*, vol. ix.

5. The following is a list of papers presented to learned societies and of public lectures by members of the Department of Mathematics:

LECTURES AND ADDRESSES

Mr. C. J. Keyser:

Meeting of the American Mathematical Society, Columbia University, New York, April 29, 1899.

"On a Definitive Property of the Covariant."

Dr. J. B. Chittenden:

Meeting of the Mathematical Section of the Brooklyn Institute, May 22, 1899.

"Three Famous Problems of Antiquity: The Squaring of the Circle, the Duplication of the Cube, and the Trisection of an Angle."

6. Of the twelve students who during the past year have pursued university courses in mathematics, five have made mathematics their major subject, three astronomy, two mechanics, one physics, and one education. Two candidates having mathematics as their major subject completed the requirements for the degree of Doctor of Philosophy:

Edward Kasner,
College of the City of New York, B.S., 1896:
Columbia University, A.M., 1897.
Minor subjects: Mechanics; Philosophy.
Dissertation: The Invariant Theory of the Inversion Group.

James Maclay,
Columbia University, C.E., 1888.
Minor subjects: Mechanics; Astronomy.
Dissertation: Double Minimal Surfaces whose Minimal Curves have Two Points on the Infinitely Distant Circle.

Two students having mathematics as their major subject completed the requirements for the degree of Master of Arts:

Grace Andrews,
  Wellesley College, B.S., 1890.
  Minor subjects: Mechanics; Physics.
  Essay: Isothermal Systems of Plane Curves.

Carl Gundersen,
  Leland Stanford Jr. University, A.B., 1897.
  Minor subjects: Astronomy; Mechanics.
  Essay: The Existence Theorem of Ordinary Differential Equations for Real Variables.

DEPARTMENT OF MECHANICS

Professor R. S. Woodward

Staff and Instruction.—At the end of the academic year 1897–98, by mutual consent of the parties concerned, Mr. Wm. H. Freedman, C.E., E.E., Tutor in Mechanics, was reassigned to the Department of Electrical Engineering.

During the past academic year, by approval of the Trustees and President, the title of the head of the Department was changed from Professor of Mechanics to Professor of Mechanics and Mathematical Physics. The teaching staff of the past year and the present official titles of the members thereof are as follows:

R. S. Woodward, Ph.D.	*Professor of Mechanics and Mathematical Physics.*
M. I. Pupin, Ph.D.	*Adjunct Professor of Mechanics.*
J. C. Pfister, A.M.	*Tutor in Mechanics.*

The courses of instruction given during the year, and the number and classification of students in attendance, are shown in tabular form below, the numbers of the courses being those of the last annual Catalogue:

Instructors	Courses	Hours per Week	Students
Prof. Woodward	1. Analytical Mechanics	3	53 Engineering
Mr. Pfister	2. Elementary Mechanics	2	9 College
Mr. Pfister	3. Theoretical Mechanics	2	2 Grad., 4 Chem.
Prof. Pupin	4. Thermodynamics	3, second half-year	44 Engineering
Mr. Pfister	5. Elementary Thermodynamics	2, first half-year	11 Chemists
Prof. Pupin	6, 7. Theory of Dynamo and Motor	3	27 Engineering
Prof. Pupin	8, 9. Theory of Alternators and Transformers	3	24 Engineering
Prof. Woodward	10. Advanced Mechanics	2	7 Graduate
Prof. Woodward	11. Theory of the Potential Function	2	11 Graduate, 2 Special
Prof. Pupin	15. Electro-magnetic Theory of Light	2	5 Graduate

For remarks concerning the work of the year as regards undergraduates reference may be made especially to the report of the Department to the Dean of the Faculty of Applied Science.

Publications.—The publications of members of the Department made up to the end of the last calendar year are detailed in Vol. I, No. 2 of the *University Quarterly*, and need not be recapitulated here. Since that date Professor Pupin has published a paper in the *Transactions of the American Society of Electrical Engineers*, embodying his theoretical and experimental researches on the propagation of long electrical waves.

Investigations.—Professor Woodward has continued during the year his studies concerning the mass, mass distribution, and moments of inertia of the atmosphere. A preliminary paper on this subject was read before the American Association for the Advancement of Science at its meeting in August, 1898. He has also investigated the problem, not hitherto attacked apparently, of the mutual gravitational attraction of two solids having a mass distribution symmetrical with respect to the same axis.

An abstract of this investigation was presented to the American Mathematical Society at its meeting of October, 1898. Work on new methods for measuring the acceleration of gravity, referred to in the last annual report, has also been continued during the year.

Professor Pupin, in addition to the published investigation mentioned above, has conducted, with the aid of Messrs. Ferguson, Perkins, Schulte, and Scudder, candidates for the degree of A.M., an experimental research to determine the shape of progressive electrical waves under varying circumstances. He has also investigated the phenomena of multiple resonance, and a theoretical paper on the Lagrangian equations and the principle of equality of action and reaction was read before the American Mathematical Society at its meeting of April, 1899.

Two valuable historical essays were prepared in the Department during the year for the master's degree by Mr. J. W. Miller, Jr., Fellow in Mechanics, and by Mr. C. H. Burnside, Scholar in Mechanics. The title of Mr. Miller's essay is, A summary of the history of the principal methods for the determination of the acceleration of gravity; that of Mr. Burnside's essay is, History and theory of moments of inertia.

Lectures and Addresses.—The Department supplied the Columbia course of lectures given during January, 1899, at the American Museum of Natural History, New York City. The first three lectures were given by Professor Woodward on "The Geography and Geology of the Great Lakes," "The Geodesy and Hydrography of the Great Lakes," and "The Climatology of the Great Lakes," respectively. The fourth lecture was given by Professor Pupin on "Boiling and Freezing."

Professor Woodward lectured also before the Section of Mathematics of the Brooklyn Institute of Arts and Science on "The Doctrine of Chances."

Gifts to the Department.—The Department is pleased to make this official acknowledgment of the liberality of Mr. Albert Rolaz Gallatin, A.B., E.E., A.M., in presenting to the electro-mechanical laboratory the following valuable instruments:

1 14-inch Induction Coil.
1 d'Arsonval Electro-Dynamometer.

These instruments have added materially to the needed equipment of the laboratory.

DEPARTMENT OF MINERALOGY

Professor ALFRED J. MOSES

Staff and Instruction.—The teaching staff has remained unchanged, namely:

A. J. MOSES, E.M., Ph.D.	*Professor of Mineralogy*
L. McI. LUQUER, C.E., Ph.D.	*Tutor in Mineralogy*
H. P. WHITLOCK, C.E.	*Assistant in Mineralogy*

The following tabulated statement shows the attendance upon the courses of instruction given during the year:

	Courses	Pure Science			Barnard	Applied Science				Columbia College	Totals
		Special	A.M.	Ph.D.	Ph.D.	1st Class	2d Class	3d Class	4th Class		
1	Blowpipe Analysis	3	1			36					40
2	Crystallography	3	1	1		36					41
3	General Mineralogy	3		1		1	1			1	7
4	Mineralogy Silicates	4	1			27		2	1		35
	Mineralogy Non-Silicates	1				2	22	2		1	28
5	Minerals of Building Stones						19			1	20
6	Optical Mineralogy						20	2			22
8	Physical Crystallography Short Laboratory Course							1	2		3
9	Physical Crystallography Longer Course		1	2	1						4

The material changes in these courses have been the addition of one lecture per week in Course 8, the substitution of one to two lectures per week for laboratory hours in Course

9 and the marked improvement in the quality of work done in these courses. Changes in Courses 1 and 4 are being forced upon the Department by the increased numbers of students and the proposed changes are stated later.

Additions to Equipment.—The equipment of the Department has been very markedly improved by generous gifts and by purchases. The principal additions were:

(*a*) Collection of about 6000 specimens by Dr. Egleston, Professor Emeritus, of which approximately 3000 were placed in the museum and the rest held for exchange.

(*b*) Complete set, 156 volumes, of *American Journal of Science*, and 88 miscellaneous volumes of works on Mineralogy or Crystallography.

(*c*) Colt lantern with optical bench presented by F. A. Schermerhorn.

(*d*) Goldschmidt two-circle goniometer, latest model, presented by Charles H. Senff.

(*e*) Large suite of oriented crystal sections for illustrating physical characters of crystals.

(*f*) Motor for section cutters.

Valuable additions were made to the museum by Messrs. W. F. Morgan, August Raht, and W. B. Devereux, and a number of rare species were secured by purchase.

Publications.—The publications of officers of the Department during the year were:

A. J. Moses—"Characters of Crystals," New York, D. Van Nostrand Co.

L. McI. Luquer—"Minerals in Rock Sections," New York, D. Van Nostrand Co.

A. J. Moses and L. McI. Luquer—Index to "Mineralogical Articles with Notes," *School of Mines Quarterly*.

Investigations.—Mr. Whitlock has continued throughout the year his study of etch figures on crystals and exhibited at the Annual Reception of the New York Academy of Sciences a series of etchings and microphotographs. He prepared also a very excellent set of lantern slides illustrating structure, which were used in the series of lectures given by the Department in February at the Museum of Natural History.

Changes Contemplated.—The continued growth of the classes, without corresponding change in the teaching staff, has made it necessary to consider some change by which each student shall be assured as good or, if possible, a better opportunity to handle and test all important species and varieties. After a careful examination of the methods at other large institutions where similar conditions prevail, the following changes have been decided upon :

(*a*) Limitation of students at any one exercise to divisions of about twenty.

(*b*) Preparation of twelve identical sets of minerals in trays, one tray, containing specimens representing the minerals of the lecture, to be dealt to each two men.

(*c*) Replacement of the present student collection by about 3000 specimens of higher grade, experience having proved that handsome specimens are respected when poorer ones are not.

It is believed that with these changes, supplemented by the museum, our students will have unexcelled facilities to become familiar with the characters and appearance of minerals.

DEPARTMENT OF PHYSICS

Professor O. N. Rood

CHANGES IN STAFF

Several changes in the personnel of the Department have occurred since the submission of the last annual report. At the commencement of the college year Dr. F. L. Tufts was advanced from the grade of Assistant to that of Tutor, and early in the fall a like promotion was made in the case of Dr. W. S. Day, who under Prof. Hallock has been placed in charge of the physical laboratories at Barnard College. On January 1, 1899, the resignation of Dana C. Wells, A.B., E.E., Assistant, was received, and to fill the vacancy thus occasioned, W. B. Johnstone, C.E., a graduate of the School of Mines of the Class of 1895, was appointed.

The staff of the Department as at present constituted is as follows:

Ogden N. Rood, A.M	Professor of Physics
William Hallock, Ph.D	Adjunct Professor of Physics
Reginald Gordon, A.B	Instructor in Physics
Herschel C. Parker, Ph.B	Tutor in Physics
Charles C. Trowbridge, B.S	Tutor in Physics
Frank L. Tufts, Ph.D	Tutor in Physics
William S. Day, Ph.D	Tutor in Physics
Henry S. Curtis, A.B	Assistant in Physics
Herbert T. Wade, A.B	Assistant in Physics
Theodore G. White, A.M	Assistant in Physics
William C. Andrews, E.E	Assistant in Physics
W. B. Johnstone, C.E	Assistant in Physics

LECTURE COURSES

Course I—General Physics—Light and Heat (First Half-year); Sound and Electricity (Second Half-year). Prof. Rood and Mr. Gordon.

First-year students in the Schools of Mines, Chemistry, and Engineering	111
Freshmen in the College	31
Sophomores in the College	49
Juniors in the College	6
Senior in the College	1
Specials in the College	4
University student	1
Total	203

Course II—Magnetism and Electricity (First Half-year); Sound (Second Half-year). Prof. Rood.

Sophomore in the College	1
Juniors in the College	6
Senior in the College	1
Special in the College	1
University students	2
Total	11

Course III—Units and Measurements (First Half-year); Exact Electrical Measurements (Second Half-year). Prof. Hallock.

Second-year students in the Schools of Mines, Chemistry, and Engineering	95
Seniors in the College	3
University students	3
Total	101

Course IV—Light (First Half-year); Heat (Second Half-year). Prof. Rood.

University student	1

Course V—Modes of Designing and Constructing Apparatus (First Half-year). Prof. Hallock.

Not elected.

Course VI—Meteorology (First Half-year). Mr. Gordon.

Not elected.

Course VII—Electrical Manipulation (First Half-year); Theoretical Comparison of Electrical Methods (Second Half-year). Mr. Parker.

Not elected.

Course VIII—Undulatory Theory of Light (Second Half-year). Prof. Hallock.

University students	5

Course XXXI—General Physics (For students in medicine). Prof. Hallock.

First-year students in College of Physicians and Surgeons	97

With but few exceptions the students enumerated above received instruction in practical work in the laboratories of the Department. The following summary shows the division of the work in the laboratory and the number of students in each course:

LABORATORY COURSES

Students in Columbia College.

Two hours per week introductory course in the laboratory.

Seniors	5
Juniors	8
Sophomores	56
Freshmen	34
Special students	4
Total	107

Two hours per week advanced course in the laboratory.

Senior	1

Four hours per week course in the laboratory.

Junior	1
Freshman	1

Six hours per week course in the laboratory.

Junior	1
Student making good deficiency in entrance laboratory work	1
Total Columbia College students	112

Students in Schools of Applied Science.

	First Class.	Second Class.
Course in Mining Engineering	10	8
" " Civil "	8	11
" " Electrical "	7	24
" " Mechanical "	21	16
" " Chemistry	7	8
Totals	53	67
		53
Total		120
Student engaged in special research work . . . Fourth year		1
Student engaged in special research work . . . Third year		1
Students making good deficiency in entrance work		18
Total number of students in Applied Science		140

College of Physicians and Surgeons.

First-year students actually attending in laboratories	143

Course IX	2	School of Pure Science.
Course XI	2	
Course XIII	1	
Course XX	1	
Course XXVI	1	
Course XXXII	1	
Total	8	

In addition, general and special laboratory courses were taken by 6 students, making a total enrolment of 14 students in the School of Pure Science.

The Barnard Fellowship has again been held by Dr. Heinrich Ries of Cornell University, who has continued successfully his researches on the physical properties of clays. The Tyndall Fellowship was also given to the present incumbent, Prof. R. B. Owens, who is investigating the waves emitted by thorium. No University Fellow was assigned to the Department, but a larger number of graduate students taking their major and minor subjects in Physics is to be recorded. Among the more important investigations that have been carried on during the winter have been one on Various Forms of Coherers and Wireless Telegraphy by A. E. Lawrence; another on the Movement of Air in Kundt's Tubes by B. Davis, and a Photographic Comparison of the Metallic Spectra in different parts of the Arc by A. Murray.

INVESTIGATIONS

Prof. O. N. Rood—Studies on normal and abnormal vision with the flicker photometer; completed and to be published immediately.

Prof. William Hallock—Synthesis and analysis of tone. Construction of a harmonic synthesyser.

H. C. Parker—Concerning the electromotive force of carborundum and zinc when used in certain primary cells; completed December, 1898. The effect of liquid air on the insulating properties of mica, glass, and rubber; completed. Observations of an electromotive force produced when metallic electrodes are removed from liquid air; in progress.

C. C. Trowbridge—The platinum thermometer and very low temperatures. The effect of liquid air temperatures on phosphorescent substances.

F. L. Tufts—Transmission of sound through small openings; in progress. On atmospheric electricity ; in progress. Transmission of sound through porous materials.

W. S. Day—Experimental demonstration of the effect of a displacement current.

Henry S. Curtis—The actinometer. Chemical phosphorescence.

Theodore G. White—On special methods of determining the index of refraction of small fragments of mineral substances. Experiments upon the formation of multiple images in the normal eye. Examination of well-borings by optical methods.

PUBLICATIONS

Prof. William Hallock—"Hydraulic Illustration of Wheatstone Bridge," *Science*, August 19, 1898, vol. viii., p. 206. "Mechanical Illustration of Kirchoff's Principle," *Science*, February 10, 1899, vol. ix., pp. 210, 211. "Reception and Exhibition of the N. Y. Academy of Sciences," *Science*, April 28, 1899, vol. ix., p. 616.

C. C. Trowbridge—"The Specific Heat of Metals at Low Temperatures," *Science*, July 1, 1898, vol. viii., No. 183, pp. 6–11.

W. S. Day—"A Comparison of Rowland's Thermometers with the Paris Standard, and a Reduction of his Value of the Mechanical Equivalent to the Hydrogen Scale," *Philosophical Magazine*, vol. xlvi., p. 1, July, 1898. Article, "Physics," in *International Year Book* (Supplement to *International Cyclopædia*).

H. T. Wade—"The New Testing Locomotive at Columbia University," *Scientific American*, April 15, 1899, vol. lxxx., No. 15, p. 237.

Theodore G. White—"Plant Vitality," *Asa Gray Bulletin*, vol. viii., p. 71. "Report on the Relations of the Ordovician and Eo-Silurian Rocks of Portions of Herkimer, Oneida, and Lewis Counties, New York," Appendix to the Report of the Director of the N. Y. State Museum for 1898, 52 pages, 3 maps, 8 plates. "The Fauna of the Upper Ordovician in the Lake Champlain Valley," *Bulletin Geological Society of America*, vol. x. (in press). "The Black River, Trenton, and Utica Formations in the Champlain Valley of New York and Vermont," *Annals of N. Y. Academy of Sciences*, vol. xi. (in press).

Papers presented to learned societies and public lectures delivered by members of the Department of Physics:

Professor Rood—On the Flicker Photometer, before the American Psychological Association, December 29, 1898.

Professor Hallock—Course of four lectures on "Radiant Energy," at American Museum of Natural History, December, 1898. "Ether Waves," Annual Dinner of the Worcester Polytechnic Alumni Association, February 3, 1899. "Interior Heat of the Earth," Staten Island Club, February 18, 1899. "Capillarity and Surface Tension," Brooklyn Institute, March 23, 1899. Course of nine lectures on "Radiant Energy" during March and April, in the Board of Education Series, at St. Bartholomew's Parish House. At the annual meeting of the Association for the Advancement of Science last summer, Professor Hallock was the secretary of the section of Physics.

C. C. Trowbridge—"Phosphorescent Substances at Liquid Air Temperatures," N. Y. Academy of Sciences, May 1, 1899.

F. L. Tufts—"The Transmission of Sound through Porous Materials," N. Y. Academy of Sciences, January 2, 1899. Course of thirteen lectures on "Electricity," before the Educational Alliance. Course of thirteen lectures on "Chemistry," before the Educational Alliance.

Theodore G. White—"The Fauna of the Upper Ordovician Strata in the Lake Champlain Valley," Geological Society of America, Eleventh Annual Meeting, New York, December 28, 1898.

NEW APPARATUS

New Flicker Photometer, constructed by Prof. Rood.
Wimshurst Electrical Machine.
Righi Oscillator.
Anemometer.
Large tank for experiments on the flow of liquids.
Three Small Electric Motors.
Chronograph, constructed in the Laboratory.
Adjustable Standard Mica Condenser.
Thomson Double Bridge, from Hartmann & Braun, Frankfort.
Reichsanstalt Standard Clark Cell.
Carhart Standard Clark Cell.
Two Special Rheostats.
Telescope and Scale.
Three Volt-Ammeters.
Carey-Foster Bridge for the comparison of standard ohms.
Three d'Arsonval Galvanometers.
Three Astatic Galvanometers,
Kohlbusch Balance, capacity of 1000 grams.
Kohlbusch Balance, capacity of 100 grams.
Regnault Hygrometer.
Two Bunsen Laboratory Spectroscopes.
Platinum Resistance Thermometer.
Five Achromatic Telescopes.

During the year a record of observations made with the meteorological apparatus presented by President Low to the University, has been daily posted up in the vestibule of Fayerweather Hall. This work has been done under the superintendence of Dr. Hallock.

DEPARTMENT OF PHYSIOLOGY

Professor John G. Curtis

Since the last report Colin Campbell Stewart, B.A. of the University of Toronto, Ph.D. of Clark University, has been appointed Tutor in Physiology, to date from July 1, 1898, vice Reid Hunt, Ph.D., M.D., resigned.

Instruction has been given by Professors J. G. Curtis and F. S. Lee and Dr. C. C. Stewart. The following is a summary of the courses given during the year:

Course.		No. of students, with candidacy for degree.	
I. General Physiology	5	Ph.D.	1
		A.M.	4
II. Physiology of Man and Higher Vertebrates,		M.D.	355
III. Laboratory work of Course I	5	Ph.D.	1
		A.M.	4
V. Research	12	A.M.	4
		Special	8
Total			377
Names repeated			5
Corrected total			372

The researches carried on in the Department by the members of the staff and workers under their direction were upon the following subjects:

The history of the discovery of the nervous system.

The nature and cause of muscle-fatigue.

A histological comparison of red and pale muscles.

The survival of mammalian muscle.

Inhibition of muscular contraction.

The inhibitory nerve-supply of the bladder in the cat.

A method of studying the physiology of mammalian smooth muscle.

Post-mortem changes in nerve-cells.

The cause of death from industrial electric currents.

The action of currents of high frequency and high potential on the normal and on the fibrillating heart.

The physiological action of oscillatory currents of high potential.

The progress of peristalsis in the œsophagus.

The absorption of strychnine from the several parts of the intestinal canal of the dog.

The physiological action of the saliva of *Heloderma suspectum.*

The action of cathartic drugs when given hypodermatically.

The absorption of proteids.

The action of anæsthol and ethyl chloride upon the kidneys.

The following publications by workers in the Department appeared during the year:

F. S. Lee, Ph.D.—The Ear and the Lateral Line in Fishes. In *Report of the Sixty-seventh Meeting of the British Association for the Advancement of Science Held at Toronto in August, 1897*, p. 811.

The New York Meeting of the American Physiological Society. *Science*, N. S., ix., p. 286.

Review of Peabody's "Laboratory Exercises in Anatomy and Physiology." *Science*, N. S., ix., p. 331.

General Physiology: An Outline of the Science of Life. By Max Verworn. Translated from the second German edition and edited. London and New York: The Macmillan Co., pp. xvi. + 615.

The Nature of Muscle-Fatigue. In Proceedings of the American Physiological Society, New York, December 28–30, 1898. *The American Journal of Physiology*, ii., p. xi.

Muscle-Fatigue. In Proceedings of the Fourth International Physiological Congress held at Cambridge, England, August 23–26, 1898. *The Journal of Physiology*, xxiii., supplement, p. 61.

Inhibition. *Transactions of the New York Academy of Medicine*, 1899; also *The New York Medical Record*, iv., p. 188.

C. C. Stewart, Ph.D.—On the Course of Impulses to and from the Cat's Bladder. *The American Journal of Physiology*, ii., p. 182.

A Simple Etherizing Bottle. In Proceedings of the American Physiological Society, New York, Dec. 28–30, 1898. *The American Journal of Physiology*, ii., p. x.

R. H. Cunningham, M.D.—The Absorption of Fat after Ligature of the Biliary and Pancreatic Ducts. *The Journal of Physiology*, xxiii., p. 209.

A Note on the Wehnelt Interrupter. *Electrical World and Electrical Engineer*, April 29, 1899, p. 542.

S. J. Meltzer, M.D.—On the Influence of Fasting upon the Bactericidal Action of the Blood. *Journal of Experimental Medicine*, iv., p. 131.

On the Causes of the Orderly Progress of the Peristaltic Movements in the Œsophagus. *The American Journal of Physiology*, ii., p. 266.

R. C. Kemp, M.D.—Intestinal Irrigation with Normal Salt Solution, Double-Current Method. In Baruch's *Principles and Practice of Hydrotherapy*. New York: Wm. Wood & Co., p. 239.

W. H. Thomson, M.D., LL.D., and R. C. Kemp, M.D.—Case of Chronic Infective Endocarditis, with Streptococci Found in the Blood before Death, Treated with Anti-Streptococcus Serum, and Experiments on the Effects of Injections of Serum and of Antitoxins upon the Kidneys. In *Transactions of the Association of American Physicians, Thirteenth Session, Held at Washington, D. C., May 3, 4, and 5, 1898*, xiii., p. 399.

Experimental Researches on the Effects of Different Anæsthetics on the Kidneys. *The New York Medical Record*, liv., p. 325.

DEPARTMENT OF ZOÖLOGY

Professor HENRY F. OSBORN

1. Staff.—Professor Osborn returned in September 1898, after spending six months of his sabbatical year among the principal museums and laboratories in Northern Europe in the interests of his lecture courses in the University and of the American Museum. He also attended the Zoölogical Congress at Cambridge and with Prof. H. G. Seeley opened the discussion upon the Origin of Mammals. Professor Wilson was obliged through illness to temporarily resign his duties and go abroad in October, six months earlier than he had expected. His time has been given chiefly to zoölogical work upon the Nile and to the revision of his work upon "The Cell," at Naples. Dr. Gary N. Calkins, Tutor, aided by Mr. Henry E. Crampton, took the chief part of Professor Wilson's work in Elementary Biology, General Zoölogy, and Comparative Zoölogy. Adjunct Professor Dean aided by Mr. James H. McGregor, Assistant, and Mr. Henry E. Crampton, Lecturer, conducted the general Zoölogy and Elementary Zoölogy on the Invertebrate side. Professor Osborn conducted the Elementary Biology and Comparative Zoölogy on the Vertebrate side. Dr. Oliver S. Strong, Tutor, conducted two courses in Neurology besides taking charge of a class of 170 students in the Medical School. Mr. F. E. Paulmier, Fellow, and Mr. Francis B. Sumner assisted in the instruction and in the preparation of teaching exhibits for the Museum.

The Department was reorganized at the close of the year, at the request and recommendation of Professor Osborn.* The Trustees approved his resignation as administrative head of the Department. He will hereafter give his time to research, and conduct graduate or university courses only, especially upon the "Evolution of the Vertebrates." Professor Wilson becomes Acting Head Professor of Zoölogy and, with the assistance of Professor Dean, will administer the Department. Dr. Calkins is advanced to the grade of Instructor and Dr. McGregor is appointed Tutor.

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* Letter to President Low, dated April 21, 1899.

2. *Courses.*—Altogether 89 students received instruction (as against 81 in 1898), of whom 65 were undergraduates in the School of Arts, of Applied Science, and of Barnard, and 24 were graduates from all parts of the United States. Of the latter, however, only 5 were pursuing major work in Zoölogy, the remainder being minor Ph.D. and M.A. students and graduate investigators already holding advanced degrees. This accounts for the comparative small number of graduate courses which were elected this year. The number of major candidates in Zoölogy will be greatly increased next year. The demand for our graduate students as professors and instructors in other colleges has increased in a very marked manner during the past year.

Instructors	Courses	Hours per Week	Students	Total
	[College and University]			
Prof. Dean	I. Elementary Zoölogy	2	30 1st year S. App. Sci.	30
Dr. Calkins	II. Elementary Biology	6–9	2 Ph.D	
Prof. Osborn Dr. Calkins Mr. McGregor Mr. Crampton			5 Specials 3 Senior B.A. 9 Junior B.A. 1 Soph. B.A. 3 Sen. Barnard B.A. 9 Jun. Barnard B.A.	32
Prof. Dean Dr. Calkins Mr. McGregor Mr. Crampton	III. General Zoölogy	6–9	3 Ph.D. 3 Senior B.A. 1 Junior B.A.	7
Dr. Strong	IV. Comparative Neurology	4–6	1 Ph.D. 2 B.A. 1 Special	4
Prof. Osborn Dr. Calkins	V. Comparative Zoölogy	12	2 Ph.D. 1 Special	3
Dr. Calkins	X. Protozoa	3–6	2 M.A. Barnard 1 Ph.D. Columbia	3
	XI. Advanced Biology		3 Ph.D. Columbia 1 Ph.D. Barnard 1 Ph.D. S. App. Sci. 1 M.A. Columbia 3 M.A. Coll. P. & S. 2 Special graduates	11
Dr. Strong	XIII. Human Brain		2 Senior B.A. 1 Junior B.A.	3

We enjoyed a fifth course of University Biological lectures, of a profoundly philosophical character, by Professor W. K. Brooks, of the Johns Hopkins University. The subject, "The Foundations of Zoölogy," embraced ten critical and historical discussions of contemporary biological problems. Shortly afterwards the lectures appeared as Volume V. of the *Columbia Biological Series* and have attracted wide attention.

3. Laboratory Researches.—The varied nature of the researches pursued in our laboratory constitutes one of its chief educational advantages. The Fellow, Mr. F. C. Paulmier, completed his investigations upon the spermatogenesis of insects, while Mr. McGregor finally completed for a second time (the first thesis having been lost in Alaska) his investigations upon spermatogenesis in the Amphibians. Mr. Crampton's work has been principally a comprehensive study of cell-history. Mr. F. B. Sumner has pushed forward with marked success his studies upon the embryology of fishes. Professor Dean has completed the first part of a Memoir upon the embryology of *Bdellostoma*, dealing mainly with the external stages, and soon to appear in Munich in the v. Kupffer *Festschrift;* he has also completed a new classification of the Fishes; Mr. R. W. Shearman has added a number of new points to the morphology of the skull of Chimæra, part of our Puget Sound collection. Finally in the same field Messrs. Harrington and Sumner have systematically arranged the fishes of the first Senff expedition to the Nile. Mr. H. T. Linville, a graduate of Harvard, has begun investigations upon the embryology of the Mollusca. Dr. Strong and his students, Messrs. Lawrence, Jelliffe, Herrick, and Miller, have completed a number of researches on the brain and nerves of more or less importance. Dr. Calkins has given his time chiefly to his volume *Protozoa* for the *Columbia Biological Series.* Professor Osborn, besides several briefer articles, has completed two memoirs upon extinct reptiles, a Mosasaur and a Dinosaur, now in press at the American Museum. Altogether the results of the year are solid, but nothing as brilliant has been produced as in some previous years. The most exhaustive research is that of Professor C. Judson Herrick,* which, we believe, forms a permanent contribution to neurology. It is gratifying to note that this Memoir upon the Cranial Nerves of the Bony Fishes, mainly executed in our laboratory, received the Cartwright prize ($500) at the College of Physicians and Surgeons and is published in handsome form by the State Institute of Neurology. The theses of Crampton and Paulmier also deserve high commendation.

4. Publications.—The record of miscellaneous publications in the *Columbia University Quarterly* for March includes thirty memoirs, papers, and reviews by members of this Department during 1899. While this is adequate it is not satisfactory when examined in detail. Some of the junior members of the staff are not exhibiting sufficient energy and breadth in investigation.

The *Puget Sound Zoölogy*, Columbia University Contributions, has now reached thirteen numbers, including work upon the collections by specialists in the Universities of Dundee (Scotland), Harvard, Williams, Michigan, and California, besides nine papers from members of our staff.

The *Columbia Zoölogical Contributions* Series has at last received a substantial impetus. Vol. I., part 1, containing papers by Osborn, Wilson, Dean, Willey, and Strong, is now being printed. Through the liberality of Professor Whitman, Editor, a special number of the *Journal of Morphology* will be issued, exclusively as a Columbia number, with papers by Wilson, Matthew, Harrington, McGregor, Crampton, Paulmier, and constituting Vol. I., part 2, of the Contributions.

The *Columbia University Biological* Series, as above noted, is greatly strengthened by the welcome addition of Professor W. K. Brooks's *The Foundations of Zoölogy*, constituting Volume V. Professor Wilson's *Cell* is now being revised for a third edition. Arrangements are being made to translate this volume into French, and this volume as well as Professor Osborn's *From the Greeks to Darwin* into Italian.

A Memoir upon the Anatomy of Polypterus is to be undertaken jointly by Messrs. Dean, Harrington, McGregor, and Strong of Columbia, by Professors Herrick of Denison and Wheeler of Chicago. It will be published by the Senff Fund.

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* To be submitted in 1900 for the Ph.D. degree.

5. *The Senff Zoölogical Expeditions.* — The first expedition to the Nile during the summer of 1895 was the third and by far the most difficult we have sent out. Having secured in the West by our two Puget Sound and Alaska parties the developmental stages of *Chimæra* and *Bdellostoma*, two rare and ancient fishes, we were stimulated to undertake the discovery of *Polypterus* whose development is confidently expected to settle the problem of how the air-breathing Vertebrates sprang from water-breathing ancestors. As *Polypterus* occurs only in the equatorial regions of Africa the expedition was a hazardous one, owing to the unhealthfulness of the West Coast and the occupation of the Upper Nile by the Mahdi. Mr. Nathan R. Harrington, Fellow in Zoölogy, and Dr. Reid Hunt, Tutor in Physiology, volunteered to go to any region where the fish were likely to be found spawning, and showed throughout the most praiseworthy scientific spirit and energy. The funds ($1800) were contributed in a most generous manner by Charles H. Senff, Esq., a former benefactor of the Department and an ever helpful friend of Columbia ; supplemented by a subscription of $200 from Professor Osborn. Aided by the advice of many eminent English naturalists, by officials of the Egyptian Government and Fisheries Administration, the party finally located upon the Lower Nile near Damietta on June 10th. They worked in this region all summer and secured a superb collection of Polypterus specimens, besides a representative collection of Lower Nile fishes and other specimens of great value for study and exchange, but none of the young stages. These fishes have been sent in exchange to a large number of institutions in this country and abroad. During the past winter a second expedition was planned, chiefly by Messrs. Harrington and Sumner (Fellow in Zoölogy). Again Mr. Senff displayed his confidence and desire to promote zoölogical research, by a still more liberal contribution of

$5000 as a fund to be devoted to purposes of exploration and publication, according to the judgment of Professor Osborn. $500 of this was at once set aside for publication and $1000 for two Annual Fellowships to be known as the Senff Zoölogical Fellowships, enabling Messrs Harrington and Sumner to devote a year if necessary to this work. Dr. Hunt sailed for Naples with Mr. Sumner, and Mr. Harrington left by way of London to secure additional information. Strong hopes are entertained that the party will be able to reach the breeding-grounds of *Polypterus* upon the Upper Nile.*

6. General Marine and Fresh-water Work.—Professor Dean accompanied by Mr. Gregory (Senior, B.A.) will return for the season to the California coast (where *Bdellostoma* was secured two years ago).

Professor Wilson established a temporary laboratory at Mansourah upon the Lower Nile waiting for the return of Polypterus; but when after a long period the fish began to appear it was ascertained that the females had spawned. He left for the Naples Zoölogical Station.

Wm. E. Dodge, Esq., has kindly continued his subscription ($250) to the University Table at Naples, which has been occupied by Professor Wilson and Messrs. Sumner and Hunt.

The Marine Biological Laboratory at Woods Holl is visited this year by Messrs. Calkins, Strong, McGregor, Crampton, and Miss Bunting, three of whom are engaged upon the teaching staff.

Messrs. Beebe and Wallace, special students of the Department, spent the summer collecting, partly for us, in Nova Scotia.

By the authority of the Trustees, the Department has subscribed to the New Biological Station at Miami, on the east coast of Florida, which will be of special value for winter work and collecting purposes.

The Wawapex Society, through its President, Mr. Walter

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*For a full official account of the expedition see *Columbia University Quarterly*, December, 1898, pp. 100–103.

R. T. Jones (Columbia B.A., Class of 1850), has established at the Marine Laboratory at Cold Spring Harbor, Long Island, the *John D. Jones Scholarship* of $250, for a table ($50), and support of an investigator ($200) from Columbia. The first appointee to this generous fund is Mr. John C. Torrey, one of our students, a graduate of the University of Vermont.

7. *Other Gifts.*—In addition to these handsome gifts, two other notable donations have been made.

The first, an endowment fund of $10,000 from Mr. Isaac Michael Dyckman, of New York, was presented by this gentleman shortly before his death. It is to be known as the *Dyckman Fund for the Encouragement of Biological Research*, and was founded as a memorial of Mr. Dyckman's uncles, who were alumni of Columbia College. The elder of these, Jacob Dyckman, graduated in the Class of 1810, and was a distinguished physician and investigator. He died when but little over thirty years of age, and was already the author of several volumes dealing with medical and biological subjects, a member of and officer in learned societies, a Fellow and Trustee of the College of Physicians and Surgeons, and Health Commissioner of New York. The younger, James Dyckman, of the Class of 1811, died at the age of twenty-one, shortly after completing his legal studies. The income of the present fund, amounting to $400, will be awarded annually either as a whole or by division, in order to promote the interests for which the fund was designed. It is hardly possible to express the pleasure which this most generous gift has afforded the members of the Department. It is given entirely without restriction and will be of the greatest service to the progress of Biology in New York.

Second, a collection of shells, valued at $3000, was donated largely through the interest of Professor Kemp of the Geological Department. This beautiful collection, given by Mrs. Henry D. Van Nostrand, in memory of her late husband, includes about 6500 species, many of great interest and value. It contains a large portion of the Bland collection of West Indian land shells and many specimens from the Perry

Expedition. Mr. Van Nostrand became interested in conchology at an early age and began a collection of shells which easily ranks with the best in the country. The nucleus of this collection was bought from Mr. John A. Redfield about forty-three years ago.

We also greatly appreciate a gift from Mr. A. A. Low, through his brother, President Low, of a beautiful series of Japanese water-color paintings, illustrating the fishes and other sea life on the coast of Japan. These are now hung upon the stairway and in the Museum Hall.

8. Recommendations.—The especial needs of the Department at the present time are as follows:

1. A publication fund of $500 per annum.
2. A gift of $5000, for the increase of the teaching collections.
3. An increase of the departmental maintenance fund to $1500 per annum.
4. An additional Zoölogical fellowship.

Conclusion.—This report, the last to be made by the writer, marks the close of seven years of development of the Department of Zoölogy, which was founded by the Trustees in 1891, and opened in 1892. In resigning from active administration, the writer desires to express to the Trustees, to the President of the University, and to the Dean of the Faculty of Pure Science, his sincere acknowledgments of their unvarying support. The writer would also express his warm appreciation of the services which his senior colleague, Professor Wilson, has rendered the Department and the University, as well as of the able and friendly coöperation of Professor Dean and Messrs. Calkins, Strong, Crampton, and McGregor, his colleagues upon the Zoölogical staff.

THE LIBRARY

REPORT OF THE LIBRARIAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1899.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to make the following report for the library for the year ending June 30, 1899:

GROWTH OF THE LIBRARY

The number of volumes added during the year was 25,404, of which from purchase or exchange there were derived 18,288 volumes; from gift, 5141 volumes; and 1975 volumes from the binding of pamphlets and other material received unbound during the year, or already in the library in unbound form. The library now numbers, exclusive of duplicates, above 275,000 volumes. The number of books received by gift during the year, including duplicates not added to the library, was 5614; the number of pamphlets given was 8433; the number of persons or institutions recorded as having given books or pamphlets during the year is 1082.

The large growth for the year is due, not to unusually important gifts of books or money, although funds have been available for steady and regular purchases in many directions, but rather to increased small gifts from institutions and individuals, arising, in part, from solicitation by letter or blank form, and still further to some unusual opportunities for large purchases at moderate rates which the library was enabled to utilize.

The area from which gifts of documents and reports of all sorts flow naturally into the library, or can be induced to flow in by means of written requests, is a constantly broadening field which, if properly worked, will yield from year to year larger returns.

The most important accretion to the library during the year was made possible through the generous aid of Mr. F. A. Schermerhorn, a Trustee of the College. Through his kindness the Librarian was enabled to buy from the sale at auction in Boston, late in May, of the library of M. Anatole De Montaiglon, late Professor of L'École des Chartes in Paris, 3257 volumes, together with several hundred pamphlets, including many scarce, expensive, and valuable books in ecclesiastical history and the history of France. Included in these purchases were a set of the "Acta Sanctorum" in sixty-three folio volumes, the scarce and expensive "Gallia Christiana," sixteen volumes, a fine copy in the original edition; the "Catalogue Général des Manuscrits des Bibliothèques Publiques de France" in forty-three volumes, and numerous collections of historical documents and archivistic publications in French general and provincial history.

From the private library of the late Joseph Köllner of New York City, a collection of German literature and history, especially rich in works on Bavaria, of which Dr. Köllner was a native, there were bought under very favorable conditions over 1300 volumes.

Aside from these purchases, perhaps the most important additions made during the year, in point of numbers at least, are the purchases in philosophy and education in which about 2200 volumes have been added.

An interesting addition made during the year was a collection of more than 1100 pamphlets issued during the French Revolution. They were mostly reports and other official and semi-official documents directed to the legislative bodies in France during the years 1789–91. They were bound in thirty-three volumes arranged by topics. Also a body of about 1000 dissertations on Greek literary history and archæology was acquired. These have been carefully arranged by topics and bound.

Following the interest and importance which the subject has assumed, an unusually rich collection of material on the Philippine Islands has been formed, including many Spanish works and books printed in Manila.

No funds have been received during the year, making possible important additions in any special direction in the library. The expenditure of the fund of $5000 for history, mentioned in the last report, has been practically completed, and many books have been added in German history of the period of the Reformation and in the history of the French Revolution.

The additions to the library for the past ten years are as follows:

1889–90	14,125
1890–91	16,440
1891–92	15,408
1892–93	19,797
1893–94	15,161
1894–95	24,839
1895–96	20,584
1896–97	11,298
1897–98	16,377
1898–99	25,404
Total	179,433

Dividing this space of ten years into five-year periods, we find the additions to the library during the five years ending June 30, 1894, were 80,931 volumes, while the number in the second period of five years ending June 30, 1899, was 98,502. It may be interesting to note that the additions to the library during the five years ending June 30, 1889, were 35,836, of which 8500 were added during the year 1888–89. The number of books in the library July 1, 1889, was a little above 90,000 volumes, so that the library is now substantially three times as large as it was ten years ago. It should also be noted that this development has not been attained by receipt through purchase or gift of any large collections of books, but has been made work by work substantially by purchase. Although the greater part of these books have been bought from Europe, no representative of the library has visited Europe for the purpose of buying books during this period, but they have been bought through agents or otherwise, from catalogues and lists, from the Librarian's office.

The two largest additions by gift, of a collection, or by purchase *en bloc*—the library of the late President Barnard, given to the University after his death, and the Struve Library, bought in 1892—did not, taken together, add many more volumes to the University Library than were acquired in May from the gift of Mr. Schermerhorn from the Montaiglon Library.

Columbia University Library has during this period grown to become, in the size and character of its collections, one of the two or three places in the country where research can be best carried on. While much remains to be done, and the expenditure of considerable sums of money will be required to gather into the library the literary and scientific productions of the past, the situation is radically different from that which was at hand ten or fifteen years ago. It then seemed to the Librarian, as probably to those who best knew the needs of the institution in the direction of books, that the most pressing demand which the young and growing University had was the creation of a library. What was needed was a collection on all subjects taught or investigated in the entire University, which should be as ample, complete, and exhaustive in its contents and as carefully arranged and fully catalogued as possible. It was to the realization of this thought that the Librarian devoted himself, with all the material resources and all the intellectual and material aid which he could obtain from others. Such material resources have been made available sometimes in larger and sometimes in smaller measures. The sympathetic aid and coöperation of the officers of instruction in the several departments have been enjoyed in varying degrees, and the success attained has sometimes been highly satisfactory and at other times has been less marked. On the whole, the results reached are such as may be looked upon with a reasonable degree of satisfaction.

The library as it now stands has by no means in any department reached the completeness to which the Librarian and those who have been most interested in its development have aspired. In most fields, the best than can be said is that the library affords material for research in a fairly satisfactory manner and compares advantageously with any other collections in the country.

The titles of some of the more important sets of books acquired during the year are as follows:

Acta Sanctorum, 63 vols.
Alemania, Zeitschrift für Sprache, Kunst und Altertum, 25 vols.
Algemene konst- en letter-bode, 139 vols.
Annales des mines, 162 vols.
Archiv fur Psychologie, Historie, Literatur og Kunst, 13 vols.
Archives historiques du Poitou, 25 vols.
Bibliothèque des sciences et des beaux arts, 36 vols.
Biographiskt lexicon öfver namkunnige svenska män, 33 vols.
Blätter für Gefängnisskunde, 17 vols.
Bulletin des sciences géographiques, 28 vols.
Catalogue de l'histoire de France, 11 vols.
Catalogue de MSS. aux archives et bibliothèques de France, 46 vols.
Concepcion, Historia general de Philipinas, 14 vols.
Congregational quarterly, 20 vols.
Der Naturforscher. 20 vols.
Dictionnaire topographique de la France, 21 vols.
Dwight's journal of music, 40 vols.
Freies deutsches Hochstift: Berichte, 16 vols.
Gallia Christiana, 16 vols.
Genlis, Mme. de, Œuvres, 66 vols.
Gubernatis, Storia universale della letteratura, 18 vols. (completing the set).
Hollandsche maatschappy d. wetenschappen; Publications, 58 vols.
Hollandsche maatschappy van fraaye kunsten; Verhandelingen, 13 vols.

Il nuovo cimento ; giornale fondato per la fisica e la chimica, 80 vols.
Institution of naval architects ; Transactions, 41 vols.
Jahrbuch der Hamburgischen wissenschaftlichen Anstalten, 11 vols.
Journal historique et politique, 62 vols.
Kosmos, Zeitschrift für die gesamte Entwickelungslehre, 15 vols.
Krünitz, Oekonomische Encyclopädie, 242 vols.
Künstler-Monographien, hrsg. von H. Knackfuss, 37 vols.
Lafuente y Zamálloa, Historia general de Españos, 30 vols.
Le tour du monde, 70 vols.
Leibnitz, Werke, 18 vols.
Leyden—Maatschappy der Nederlandsche letterkunde ; Werken, 69 vols.
Library of the world's best literature, 30 vols.
Littell's living age, 75 vols. (completing the set).
Ludewig, Reliquiæ manuscriptorum omnis ævi, 12 vols.
Luther, Opera, 28 vols.
Luther, Werke, Kritische Gesammtausgabe, 14 vols.
Manz'sche Taschenausgabe der österreichischen Gesetze, 20 vols.
Memoires de Trevoux, 306 vols.
Memoires lus a la Sorbonne, 14 vols.
Moroni, Dizionario di erudizione, 103 vols.
Naturforscher Verein zu Riga ; Correspondenzblatt, 41 vols.
Necker, Jacques ; Œuvres complètes, 15 vols.
Nuremberg—Literarischer Verein ; Album, 25 vols.
Österreichische Gesellschaft für Meteorologie ; Zeitschrift, 20 vols.
Revue africaine, 24 vols.
Revue universelle des mines, 97 vols.
Sanuto Marino ; I diarii, 25 vols.
Schlechtendal and others ; Flora von Deutschland, 18 vols. (completing the set).
Senckenbergische Gesellschaft ; Abhandlungen, 19 vols.
Société de l'histoire de Normandie ; Publications, 44 vols.
Société de l'industrie minerale ; Bulletin, 40 vols.
Staats-zeitung, Sonntags-Blatt, 23 vols.
Stockholm—Geologiska Föreningen, Förhandlingar, 18 vols.
The Sugar cane, 21 vols. (completing the set).

Vienna, Botanischer Verein ; Verhandlungen, 24 vols.
Weekly reporter, Appellate High Court, Calcutta, 26 vols.
Weekly reporter, London, 46 vols.
Würzburg—Physikalisch-medicinische Gesellschaft ; Verhandlungen, 28 vols.
Zedler, Grosses vollständiges Universal-lexicon, 43 vols.
Zeitschrift für das Berg-, Hütten-, u. Salinen-wesen, 45 vols.
Zeitschrift für Kirchengeschichte, 18 vols.
Zeitschrift für Physik und Mathematik, 10 vols.

THE USE OF THE LIBRARY

Mr. C. Alexander Nelson, Deputy Librarian, in general charge of circulation, reports that the number of volumes loaned during the year was 77,260 and that a renewal was asked on 39,288 loans ; total circulation, 116,548. Continuing the report, he states that the average number of evening readers present at nine o'clock was: For July (1898), 19; August, 14; September, 14; October, 54; November, 61 ; December, 51 : January (1899), 58; February, 47; March, 63 ; April, 73 ; May, 64; June, 14. The largest number, 114, on April 24; the smallest, 7, on August 1.

It may also be permitted the Librarian to present a little résumé of the use of the library during the ten years of his administration, as shown by the loans of books from the library. They are as follows:

1889–90	16,004
1890–91	22,721
1891–92	26,632
1892–93	28,184
1893–94	42,015
1894–95	53,471
1895–96	59,756
1896–97	67,975
1897–98	47,832
1898–99	77,260
Total	441,850

It will be remembered, explaining the apparent break in the steady increase in the use of the library for the year

1897–98, that the library was closed during many weeks on account of removal to the new site. It should also be noted that the record of loans since the occupancy of the new building does not include any loans made by the Law Library or from any departmental library, but only the transactions at the general loan desk. The record of loans for the year 1888–89, ten years earlier, was 11,325. It thus appears that the library is doing in the matter of loans from six to seven times the business it did ten years ago. The use of the large reference library and of the books withdrawn from circulation on special lists furnished by officers of instruction, all of which must be studied in the general reading-room, together with the use in the special study rooms, in the Law Reading Room, the Avery Architectural Library, and the twenty departmental libraries, make up a record which in addition to the home use, indicated above, measures more completely the present utility of the University Library.

CATALOGUE DEPARTMENT

During the year the Catalogue Department has prepared and written and placed in the catalogue 61,034 new cards. In addition, 31,704 cards were removed for corrections or additions and replaced. The number of new cards made during the last ten years is as follows:

1889–90	19,254
1890–91	28,647
1891–92	39,903
1892–93	50,373
1893–94	52,418
1894–95	53,803
1895–96	48,022
1896–97	44,861
1897–98	45,687
1898–99	61,034
Total	444,002

All cards made for the library catalogue for many years have been carefully prepared in disjoined or printing hand by a well trained staff of copyists. The number of cards which a copyist can make in this manner is of course less than could be attained by the ordinary running hand, but in return the cards are very much more legible, a greater uniformity is obtained, and the serviceability of this the most important and permanent part of the library apparatus is greatly increased. The Librarian is and always has been of the opinion that no trouble and expense should be spared to secure the highest legibility in catalogue entries. The best evidence as to the character of the catalogue is the constant and very great use to which it is put.

The subject catalogue of a large library, if it is to be used and of real service, is necessarily one of the most complex and difficult intellectual undertakings which men attempt. The best fall far short of what could be desired or what will fully represent the resources of a great collection of books. With the growth of the library and the broadening out of its scope and use, the catalogue, which should be essentially a living organism, requires constant development and improvement. Only with the best technical knowledge on the part of its director, together with all available aid from experts in the various fields of knowledge, and a competent and well trained body of assistants, can a great catalogue be created and maintained. The mere aggregation of entries on cards will not realize this.

It has been for some years the plan of the Librarian, in connection with the officers of several of the departments of the University, to publish, at the earliest date in which the completeness and character of our collections in special subjects would permit, subject lists which should not only serve our own officers and students in their researches, but should make known to scholars everywhere the contents of this library in the topics chosen, and be essentially contributions to bibliography for the general use of scholars. It was, however, important, in the constant rapid growth of the library, not to issue such lists prematurely. At the same time it is impossible to wait until absolute completeness is reached. It had been planned to issue in the near future a catalogue of our Goethe collection, the collection on Kant, and certain collections of the library in European history and in some fields of sociology and economics. If such plans are carried out in the future the resources of this library in these fields will be made better known and its usefulness to the world of scholars enlarged.

About a year and a half ago, as mentioned in the report of the previous year, a plan for the coöperative cataloguing of a selected list of scientific periodicals was entered upon by this library in connection with four other important libraries. During the past year work has been carried on successfully and 5722 cards for 2861 titles, at a cost of $71.53, have been received. In return, the library has received a credit for 590 titles catalogued to the amount of $59.00, leaving the actual cost to the library, aside from the cataloguing, for the 5722 cards and their printing of $12.53.

LIBRARY BUILDING

The only change or improvement in the library during the college year has been the placing in the East and South Galleries of sixteen cases with rollers to hold large books. Each of these cases has on top a glass show-case, and glazed bulletin boards have been placed in both galleries for the display of autographs and similar material. In these two galleries the Phœnix Library is kept and the available space in the show-cases and on the bulletin boards has been filled up by a selection of the more important and rare treasures of the Phœnix collection, both in books and autographs. In this manner several hundred interesting pieces have been placed on public exhibition.

When the old library site at 49th Street was sold early in the college year, it became necessary to remove all the property of the library still remaining in the old buildings. This consisted only of a body of duplicates and a mass of older College publications. These were placed in piles in the basement of the present building, as thus far no proper shelves for their arrangement and care have been provided.

Aside from this need, which is a pressing one and which has hindered any action toward exchange or disposal of these duplicates, two or three more rooms require certain fittings. Among these may be mentioned Room 105, which should be suitably divided, affording perhaps a space for a lunch room for the members of the library staff and accommodation for the gilding and repairing which are now carried on in the room, together with shelves for the accommodation of the more important College publications and official documents which are constantly required for distribution. Another need is for suitable accommodation for maps, charts, and similar material belonging to the library which still await proper indexing and arrangement.

Also in Room 211, south of the Avery Architectural Room, there should be provided a series of cases and shelves for the proper storage of the very large volumes belonging to the Avery Library which are now kept on tables in the Avery Reading Room. These same cases should provide space for the proper keeping of current numbers of periodicals, unbound parts of continued works, and such loose plates, photographs, and similar material as are now here or may later come into the library.

During the year corticine floor covering has been placed on the floors of several rooms belonging to the library, and thereby the quiet and usefulness of the rooms have been greatly increased. Other rooms used for library purposes should, as soon as possible, be provided with similar covering.

DEPARTMENTAL LIBRARIES

The system of departmental libraries, which was largely increased on removal to the new site, has been during the year still further developed. The departmental libraries existing at present are as follows:

	Vols.	Location
Architecture	974	608 Havemeyer Hall
Botanical Department	78	508 Schermerhorn Hall
Chemistry	1953	307 Schermerhorn Hall
Civil Engineering	49	403 Engineering Building
Geology	374	404 Schermerhorn Hall

	Vols.	Location
Greek	601	306 College Hall
Latin	196	306 College Hall
Mathematics	138	203 College Hall
Mechanical Engineering	3	304 Engineering Building
Mechanics	84	614 Fayerweather Hall
Metallurgy	1083	105 Havemeyer Hall
Mineralogy	538	307 Schermerhorn Hall
Mining Engineering	181	408 Engineering Building
Music	303	313 West Hall
Oriental Languages	34	405 West Hall
Pathology	124	College of Physicians and Surgeons
Physiology	23	College of Physicians and Surgeons
Psychology	99	406 Schermerhorn Hall
Teachers College	43	Library Teachers College
Zoölogy	2610	616 Schermerhorn Hall

During the year from some of the larger departmental libraries there has come the demand for a custodian who should be regularly appointed for that duty. It is probable that such custodians will be found necessary in the more important collections and that persons belonging to the library staff and regularly paid for such service should devote their time in whole or in part to the care of these collections. It has not during the year been possible to detail any one from the staff of the library for such a position.

TEACHERS COLLEGE

Early in the college year, partly from the consolidation of Teachers College with Columbia University which had been recently effected, and partly from other reasons, I was led to address a communication to the President calling attention to the relations which should exist between the two libraries. Following these suggestions the President brought about one or more conferences between himself, the Deans of the Department of Philosophy and of Teachers College and the Librarians. As a result of these consultations, recommendations were made to the Trustees and adopted by them at their February meeting, providing for the necessary coöperation in the administration of the two libraries, and the transfer of books from one library to the other from time to time as might be found desirable, and for the amalgamation of the catalogues of the educational section of the University Library and of the Bryson Library of Teachers College in such a manner as to give all persons interested information as to the books available in both libraries.

In the pursuance of this resolution the Librarian suggested a plan for the printing of the combined catalogue of the two libraries as far as it relates to educational topics, with a view to make most readily accessible to the officers and students of the University interested, the resources of the library in educational fields, and at the same time to make known to scholars and investigators everywhere the strength of the library, and to put before the public a list which would in some degree be of service as a bibliography of education. It was proposed to limit at the outset the field to be covered to titles relating to the history of education and to primary and secondary education. This proposition met with the approval of the Deans above mentioned and of the President and was resolved upon.

As a preliminary to such a publication, it seemed desirable to supplement by purchase, as far as possible, the collections already in hand, and as far as means have been available steps have been taken to effect this during the past months. At the same time we have transcribed on our regular cards in the usual form all the entries relating to educational subjects in the Teachers College Library catalogue and have incorporated them in our own card catalogue. The actual work of preparation for printing and the printing itself remains to be carried out in the future. Such a publication, if rightly made, can be of great service both to the University and to all students of educational topics.

BULLETIN OF THE NEW YORK PUBLIC LIBRARY

The *Bulletin* of the New York Public Library has continued to publish, from time to time, lists of periodicals on different topics contained in that library and the library of the University. During the year lists on the following subjects have been issued :

Literary Periodicals.
Periodicals Relating to General History.
Periodicals Relating to Science in General.
Technical Periodicals.

GIFTS

Aside from the increasing body of individuals and institutions who have given books and pamphlets to the library, the most important gift during the year was the sum of $17,500.00 given for the purchase of books by the same anonymous friend of the University who during past years has presented to the library munificent sums of money for its development.

Mr. Samuel P. Avery, following his custom for many years, has given, besides many valuable and important books, the sum of $2965.08 for the purchase of books and in payment of binding for the Avery Library. There has also been received from Mr. William G. Low $250.00 for the purchase of books on maritime law and international law. Mr. G. K. Sheridan, who has formerly given money for a similar purpose, gave, through Professor A. V. W. Jackson, $50.00 for the purchase of Sanskrit books.

Prof. Thomas Egleston gave during the year, from his private library, many important scientific periodicals and other books, for the especial use of the Departments of Engineering, Metallurgy, and Mineralogy.

As stated earlier in this report Mr. F. Augustus Schermerhorn, a Trustee of the University, gave for the purchase of books $1500.00. A committee of citizens of New York and vicinity, friends and admirers of Mr. Carl Schurz, on the occasion of his seventieth birthday, to create a permanent memorial of the man and his service, raised the sum of $10,000.00 to constitute a fund for the enlargement of the library in the German language and literature.

EXPENDITURES

The direct expenditures of the library from the appropriations made by the Trustees have been as follows:

Salaries	$29,249.76
Supplies and incidentals	2,004.50
Books and binding	11,195.22

The book account was as follows:

Appropriation	$10,000.00	Expended for books and binding	$11,195.22
Balance carried over from last year to meet outstanding orders	908.64	Balance carried to next year's account for outstanding orders	36.89
Sales and lost books	76.87		
Fines	246.60		
	$11,232.11		$11,232.11

There was expended during the year from the

Avery Fund	$ 1,172.87
Avery Gifts	2,965.08
Barnard Fund	3,345.19
Cotheal Fund	407.72
J. D. Crimmins Fund	21.64
Special Fund 1896. Closed	393.54
Special Fund 1898	10,558.79
Special Fund for History 1898	2,605.38
Senff Fund for History 1897. Closed	150.59
Senff Fund for Biology. Closed	20.87
Sheridan Fund	48.16
Loeb Fund	41.49
W. G. Low Fund 1899	165.28
Schermerhorn Fund. Closed	1,499.98

The expenditures for the binding and the repair of books in the general library were $4991.86, and there were bound for the Law Library 623 volumes at a cost of $347.30, making a total of $5339.16. In addition there were bound from the books and pamphlets bought some years since from the Struve Library, 296 volumes at a cost of $189.99, which was paid from the proceeds of sales of duplicates from the Struve Library. The whole number of books newly bound was 6752, at a cost of $4837.68. Also 1497 volumes were rebound and repaired at a cost of $691.47. These statements do not include books bound for the Avery Library at a cost of $2142.53, or the books bound abroad, the cost of which is included in the cost of the volumes. Class and book numbers were gilded on 18,371 volumes at a cost of $646.83.

Appendices show the current use of the library and give the names of those persons and institutions who during the year gave to the library books and pamphlets.

In closing at this time my active connection with the library, after nearly sixteen years of service here in varied capacity, I desire to thank all those persons who by aid, counsel, or intelligent appreciation have helped me and the library staff in the work of gathering, arranging, and cataloguing this great collection of books, and I rejoice that the opportunity was given me, under many favorable circumstances, to take a leading part in the formation of this large and important library. In particular my heartiest thanks are due to the members of the library staff for their faithful, intelligent, and efficient coöperation, their loyalty to the library and the Librarian. Their interest in the work and its results cannot be too highly commended. The confidence and friendship they have extended to me are among the choicest possessions of my life. Most of them have had their entire library experience here, and not a few have gone from here to positions of importance elsewhere.

A library which has grown up under one's hands cannot but have become very dear and precious. That to which has gone so large a span of the best of my life must assume to me immense importance. At parting from it, whatever other sentiments are unavoidable, for the library, an institution which outlasts personalities and circumstances, I cannot but entertain the deepest regard and the most earnest wishes for its constant prosperity and good report. *Floreat et crescat.*

Respectfully,

GEO. H. BAKER,
Librarian.

APPENDIX A

STATISTICS OF THE USE OF THE LIBRARY

FROM

JULY 1ST, 1898, TO JUNE 30TH, 1899

1898–99	Days Open	Loans	Renewals	Total Loans	Daily Average	Largest Day's Loans	Smallest Day's Loans	Fines	Readers' Tickets Issued
July	25	2897	1681	4578	183.1	165	78	$ 8.60	11
August	27	2607	1460	4067	150.6	135	45	5.45	5
September	26	3370	1279	4649	178.8	220	86	12.50	12
October	26	8572	3499	17071	656.5	429	180	14.45	22
November	25	8527	2186	10713	428.5	496	114	30.20	22
December	26	7369	6456	13825	531.7	405	145	30.45	12
January	26	8757	2391	11148	428.7	543	35	39.40	13
February	24	7315	1591	8906	371.0	395	33	27.05	9
March	26	9065	2623	11688	449.5	513	306	23.45	10
April	25	8362	5600	13962	558.4	393	265	23.15	14
May	27	6786	1594	8380	310.3	368	32	23.30	11
June	25	3633	3928	7561	302.4	256	102	8.60	9
TOTALS	308	77,260	39,288	116,548	378.4	——	——	$246.60	150

APPENDIX B

COLUMBIA UNIVERSITY LIBRARY

RECORD OF GIFTS, 1898–99

	Vols.	Pam.
Actuarial Soc. of Am.		12
Adams, Benj.		1
Adams, J. D.	1	
Adams Acad.		1
Adirondack Cottage Sanitarian		4
Age of Steel	4	
Agric. Soc. of Am.		1
Aguilar Free Lib'y		2
Alabama Att'y Gen.		1
" Bar Assoc.		1
" Geol. Survey.		2
" Indust. Soc.		2
" Mines Insp.		1
" Univ.		1
Albany Acad.		1
" High School		2
" P. E. Diocese.		1
" Pub. Instr. Supt.		1
Alexander, A.	1	
Alfred Univ.		3
Amal. Soc. of Carpenters	1	1
Am. Assoc. for Adv. of Sci.	2	
" Bankers' Assoc.	2	
" Bar Assoc.	2	
" Colonization Soc.		12
" Economic Assoc.	1	
" Economist	1	
" Fabian		13
" Federationist	2	
" Female Guardian Soc.		4
" Geog. and Statis. Soc.	2	
" Historical Assoc.	2	
" Institute of Architects.	1	
" Institute Elec. Eng.	2	
" Institute Mining Eng.	1	
" Irish Hist. Soc.	1	
" Mathematical Soc.	1	
" Metrological Soc.	3	
" Microscopical Soc.	1	
" Oriental Soc.	1	
" Philosoph. Soc.	1	
" Protective Tariff League	3	
Am. Soc. Extension of Univ. Teaching	3	13
" Soc. Civil Eng.	1	
" Soc. Mechan. Eng.	2	1
Amherst Coll.		1
Anderson, W. H.	3	
Andover Theol. Sem.		1
Anthony's Photog. Bulletin	1	
Archæological Inst. of Am.	1	
Argentine Repub. Scientific Soc.	2	
Aristotelian Soc.	1	
Arizona Univ.		1
Arkansas P. E. Diocese		1
Armour Inst. Tech.		1
Assoc. of Am. Anatomists		1
" of Colleges and Prepar'y Sch.		2
Astronomical Soc. of the Pacific	1	
Asylum of St. Vincent de Paul		15
Atlanta Univ.		97
Auburn Theol. Sem.		1
Austria Arbeitsstatis. Amt.	1	
Avery, S. P.	495	
Bacon, W. P.	1	
Baillie's Inst. Free Lib'y		2
Baker, George H.	74	
Bakers' Journal	1	15
Balch, Edwin S.	1	
" T. W.	2	
Baldwin Univ.		3
Banta, Theodore M.	1	
Baptist Ministers' Home Soc.		2
Barnbart Bros.		1
Basel Univ. Lib'y		81
Batchellor, A. S.	1	
Bates College		1
Bell, Clark	3	
Bennington Battle Monument Assoc.	1	
Benton, J. H., Jr.	1	
Berkshire Indust. Farm		5
Berlin Univ. Lib'y		97

	Vols.	Pam.
Beth Israel Hospital		5
Billings, Mrs. Fred.	1	
Bimetallic League	5	
Bleecker, Ja.	1	
Bloomingdale Kindergarten	4	
Boas, F.	1	1
Bogert, E. L.	1	
" H. A.	2	
Bologna Univ.	1	
Boppe, A.	1	
Bossange, E. R.	2	
Boston Auditor	1	
" Chamber of Com.	8	
" Children's Aid Soc.		1
" Gen. Theol. Sem.		11
" Park Com.		1
" Provident Assoc.		1
" Pub. Lib'y	84	13
" Records Com.	1	1
" School Com.	21	
" Transit Com.	1	
" Y. M. C. U.		1
Bostonian Soc.		2
Bowdoin Coll.		8
Bradley, W. A.	9	
Brainerd, I. H.		2
Breslau Univ. Lib'y		90
Briggs, Rev. C. A.		1
Brinton, D. G.		1
Britton, N. L.	27	
Brockport Normal Sch.		1
Brodt, P. E.	3	
Brookline Educ. Soc.		2
" Pub. Lib'y		2
Brooklyn Ass. for Impr. the Condition of the Poor.		6
" Ass. of Working Girls.		3
" Charities Bur.		3
" Children's Aid Soc.		11
" Daily Eagle	1	
" Dispensary		2
" Eye and Ear Hospital		8
" Free Lending Lib'y		1
" Ger. Hospital Soc.		9
" Guild Assoc.		1

	Vols.	Pam.
Brooklyn Hebrew Orphan Asyl.	2	
" Home for Consumptives		1
" Hospital		1
" Indus. Schools Assoc.		37
" Inst. of Arts.	1	
" Kindergarten Assoc.		4
" Maternity Hospital	2	8
" Mission Journal		1
" Nursery and Hospital		6
" Polytech. Inst.		1
" Soc. Prevent'n of Cruelty to Children		16
Brotherhood of Boiler Makers		1
" Locomotive Eng.	1	
" R.R. Trainmen	3	3
Brown Univ.		2
Brussells Univ.	1	
Buchtel Coll.		1
Buck, A. H.	2	
Buckley, L. D.		4
Budapest Statis. Bur.	4	7
Buenos Aires Museo Nacional		1
Buffalo Hist. Soc.		1
" Merchants Ex.		10
" Pub. Lib'y		2
Bugbee, L. G.		1
Bulova, J. A.	1	1
Bunker Hill Mon. Assoc.	2	
Burge, F.		1
Burlington City Clerk	1	
Bushwick and East Brooklyn Dispensary		9
Butler, N. M.	218	492
Cairnes, B. S.	2	
California Acad. of Sci.	2	
" Highways Dept.	1	
" Publ. Instr.	7	
" Univ. Lib'y		24
Cambridge City Clerk		1
" Theol. Sch.		1
Canada Agric. Dept.	2	
" Geol. Survey	2	11

	Vols.	Pam.
Canada Mines Bur.	1	1
" Royal Soc.	1	
Canadian Archivist	1	
" Institute	2	
" Soc. Civ. Eng.		2
Carleton Coll.		1
Carlson, A. J.		1
Carnegie Lib'y		18
" Museum		1
Carpenter, G. R.	6	34
" W. H.	17	
Carpenters and Joiners Assoc.	2	5
Castleton Charity Soc.		5
Catholic Univ. of Am.		3
Cattell, J. M.	85	754
Chadwick, Mrs. F. E.	6	
Chamberlain, L. T.	1	
Chandler, C. C.	18	91
Chapel Hill Fresh Air Mission		1
Chicago Educ. Com.	1	
" Jewish Training Sch.		1
" Law Club		1
" Mayor	1	
" Pub. Lib'y		1
" Theol. Sem.		2
" Trade Bd.	4	
" Univ.	2	
" Milwaukee and St. Paul R.R.		1
Choate, J. H.		2
Christian Social Union.		37
Christiana Univ. Lib'y		11
Church Assoc. for Adv. of Interests of Labor		23
Cincinnati Pub. Lib'y		1
" School Supt.		1
" Univ.		4
City and State	3	
Cleveland Municipal Assoc.		1
" School Com.	9	3
Clews, Elsie	2	
Colby Univ.		3
Cole, G. W.	258	663
Colgate Univ.		1
Coll. of the City of N. Y.		1
Colorado Agric. Coll.		7
" Bar Assoc.	1	
" Charities Bd.	1	1
" P. E. Diocese		1
" Treas.	1	
" Univ.		1

	Vols.	Pam.
Columbia Literary Monthly	4	
" Morningside	3	
" Observatory	24	275
" Patholog. Dept.		1
" Polit. Sci. Quarterly	28	30
" Sch. of M.Q.	2	
" Spectator	2	
Columbian Univ. Wash.		1
Columbus Hospital		2
" School Supt.		1
Commonwealth	1	
Conn. Bank Com.	1	
" Charities Bd.	1	
" Educ. Bd.	8	
" Health Bd.	2	
" Hist. Soc.		3
" Humane Soc.		1
" Insurance Com.	20	
" Labor Bur.	1	
" R. R. Com.	1	
" Treas.	1	
Consumers' League		11
Cooper's Journal		2
Cornell Univ.	3	2
Crow, M. R.		1
Crozier Theol. Sem.		1
Cudmore, P.		1
Currier, C. G.	1	1
Curry, J. L. M.		2
Cutler Mfg. Co.	2	
Cutler School		1
Dabney, C. W.		2
Dalhousie Univ.		1
Dante Soc.		2
Dartmouth Coll.	1	
Davidson, J.		1
Davis, A. McF.		3
" Walter A.	1	
Davison, C. S.		1
Day, A. M.		54
Dayton Pub. Lib'y		1
De Costa, B. F.	7	
Delaware Sec. of St.		1
Denver Charities Bd.	1	1
" School Supt.		20
" Univ.		4
De Pauw Univ. Lib'y		1
Depew, Chauncey M.	2	
De Peyster, Gen. J. W.	23	
Detroit Educ. Bd.		1
" Pub. Lib'y		1
Dexter, F.		1

	Vols.	Pam.
District of Columbia School Supt.		8
Dorpat Univ. Lib'y		22
Douai Pub. Lib'y		2
Douglas, Ja.	1	
Dowd, Ella	1	
Drew Theol. Sem.		2
Dunning, W. A.	4	3
Edgewater Crèche		2
Edinburgh Summer School		10
Educational Alliance	1	
Egleston, T.	885	5
Einhorn, M.		4
Elkins, W. L.	1	
Ellis, G. W.		1
Emanuel Sisterhood		1
Emmet, T. A.	1	
Erlangen Univ. Lib'y		300
Ex Dono Amici Literarum	125	
Fairbairn, H. A.	1	
Fairbault, C. R.		1
Fairfield Co. Hist. Soc.		8
Faraday Inst. of Education		4
Federation of Day Nurseries		3
Field Columbian Museum		2
Fisher, Geo. F.		1
Fisk Univ.		1
Fitchburg City Clerk	2	
Fletcher, H.	1	
Forbes Lib'y		1
France Acad. des Sciences	1	
" Min. de l'Instr. Pub.	8	16
" Min. du Commerce	13	2
Franklin and Marshall Coll.		2
" Soc. f. Home Coll. Building		10
Freiburg Univ. Lib'y		94
Gallup, Alb. S.	1	
Ganson, J. W.	15	
Garment Worker, The		7
Gennadius, J.		1
Geol. Soc. of Am.		2
Georgia Geol. Survey	1	7
" P. E. Diocese		1
German Evan. Aid Soc.	1	8

	Vols.	Pam.
German Ladies Soc. f. Relief		22
" Masonic Temple Assoc.		15
" Soc. of N. Y. City		3
Germantown Friends Free Lib'y		1
Giessen Univ. Lib'y		58
Gloucester City Clerk	1	
Gompers, S.		1
Good Government		14
Good Samaritan Dispensary		1
Göttingen Univ. Lib'y		83
Graham, A.	1	
G. A. R. Journal	1	
Grand Rapids Educ. Bd.		3
Gray, L. H.	1	
Great Britain Labor Bur.	1	
Green, S. S.		2
Green, S. A.		2
Grenoble Univ.		1
Greeley, Mrs. M. M.		2
Grosvenor Pub. Lib'y		3
Grout, A. J.		1
Guiding Star Pub. Co.		4
Gunton, Ellen	19	
Halle Univ. Lib'y		95
Hamilton Coll.		2
Hampton Inst.		1
Harlem Exchange for Women's Work		1
" Lib'y		1
" Relief Soc.		1
Hartford City Clerk	1	
" Hospital		1
" Sch. Visitors Bd.		2
" Theol. Sem.		2
Hartley House		1
Hartwick Sem.		1
Harvard Club of N. Y.	2	
" Museum of Comp. Zoöl.	1	3
" Univ.	4	2
" " Lib'y	1	1
Hatmakers' National Assoc.		26
Haverford Coll.		8
Hebrew Free Loan Assoc.		3
" Orphan Asylum		10
" Sheltering Guardian Soc.		8

	Vols.	Pam.
Heidelberg Univ. (Ohio)		39
" (Germ.) Univ. Lib'y		132
Hendrix Coll.		1
Henry, H. T.		1
Hickman, J. P.		1
Higginson, J. J.	1	
Hobart Coll.		1
Holden, E. B.	15	
Holland Finance Min.	1	
Holland Soc. of N. Y.	1	
Home Hotel Assoc.		2
Honolulu Sec. Foreign Affairs		3
Houghton, Mifflin & Co.	1	
Howe, Mrs. S. P.	1	
Hrdlicka, A.		1
Hubbard, O. P.	1	
Huguenot Soc. of Am.		4
Hunterian Museum Glasgow	1	
Huntington, G. S.		8
" H.		1
" W. R.	1	1
Idaho Land Com.		1
" Pub. Instr.		1
Idle, T. W.	1	
Illinois Examiner of Architects		1
" Insur. Supt.	35	
" Labor Statistics	3	
" Pub. Instr. Supt.	7	
" St. Lab. Nat. Hist.		2
Independent Order of Benai Berith		64
Indian Rights Assoc.		2
Indiana Acad. Science		1
" Geol. Survey	1	
" Pub. Instr.	21	
" St. Charities Bd.		3
" St. Lib'y	14	1
" Statistics Bur.	1	
Indianapolis Monetary Convention	1	
Industrial Colony Assoc.		2
Institute of Civil Eng.	7	1
Intercontinental R. R. Com.	6	1
International Law Assoc.		11
Iowa Acad. of Science	1	
" Hist. Dept.	2	3
" R. R. Com.	1	
Iowa Univ. Lab. Nat. Hist.		1
Iron Age	3	
Italy Min. di Agric.	1	1
" " of Finance	2	
Japan Imp. Univ.		13
Jersey City Educ. Bd.	1	
Jewish Theol. Assoc.		1
John Crerar Lib'y		1
Johns Hopkins Univ.	2	30
Johnston, Mrs. P.		1
Jones, R.	1	
Jordan, Mrs.	1	14
Journeyman Tailors' Union	2	
Kalbfleisch, C. C.	73	3
Kansas Agric. Coll.		3
" Coal Mine Inspec.	1	
" Labor. Bur.	1	
" R. R. Com.	1	
" Univ. Quarterly	1	6
Kenyon Coll.		1
Kew Gardens	1	
Keystone Acad.		1
King, C. R.	1	
" Horatio C.		1
Kleber, H.	1	
Knauff, C. W.	1	
Knickerbocker Athletic Club	1	
Knopf, S. A.		1
Königsberg Univ.		52
Kunz, G. F.		2
" J. J.	2	
Lafayette Coll.		1
" Post	2	
Laidlaw, A. H.	1	
Lake Forest Univ.		1
" Mohonk Conference		2
La Plata Museo	2	
Laura Franklin Free Hospital		12
Laval Univ.		1
Lehigh Univ.		2
Leiden Univ. Lib'y		6
Leipzig Univ. Lib'y		155
Leland Stanford, Jr., Univ.		4
Lemcke, Ernst	2	
Lewis, A.	1	
Little, J. J., & Co.	1	
Liverpool Pub. Lib'y		1
London Co. Council	2	2

	Vols.	Pam.
London Trade Bd.	2	8
" Univ.	2	
Long Isl'd Church Charity Soc.		1
" " P. E. Diocese		2
Longshoremen's Assoc.		1
Los Angeles Educ. Bd.		4
Loubat, J. F.	194	
Louisiana Att'y Gen.	1	
Louisville Sch. Supt.	3	
Low, Seth	55	172
Lowell City Lib'y		1
" Water Com.		2
Lund Univ. Lib'y	1	
Lyons Univ.	5	3
MacBean, A. C.	1	
McDowell, Mrs. C. E.	1	
" E. A.	22	
McGill Coll. and Univ.		13
McMullen, Mrs. J.	2	
Madras Museum		1
Maimonides Free Lib'y		1
Maine Bugle	4	
" Health Bd.	1	
" Labor Bur.	1	
Manchester Water Com.		1
Manhattan Eye and Ear Hospital		1
Marburg Univ. Lib'y		80
Margaret Strachan Home		9
Marietta Coll.	1	
Maryland Educ. Bd.	11	
Mass. Agric. Ex. Station		8
" Ancient and Hon. Artillery Co.	1	
" Arbitration Bd.	2	
" Auditor	1	
" Bank Com.	2	
" District Police	1	
" Educ. Bd.	7	
" Gas and Elec. Light Com.	1	
" Gen. Hospital		1
" G. A. R.	1	
" Health Bd.	1	
" Insurance Com.	2	
" Labor Bur.	6	5
" Lunacy and Charity Bd.	2	
" P. E. Diocese		1
" R. R. Com.	1	
" Reform Club		3
" St. Lib'y	2	
Mass. Woman's Relief Corps	1	
Mather, F. G.	2	
Matteawan Hospital		1
Matthews, Brander		1
Mayne, R. E.	1	
Meadville Theol. Sch.	1	
Memphis Educ. Bd.		2
Merck, E.		1
Merriam, J. S.	28	
M. E. Ch. Educ. Bd.		1
Mexico Geol. Survey		6
Meyer, Mrs. A. N.	1	
Meyer, I.	1	
Mich. Adj.-Gen.		1
" Agric. Coll.	1	19
" Auditor	1	
" Bank Com.	1	
" Coll. of Mines	1	1
" Corrections and Charities Bd.	2	
" Educ. Bd.	16	9
" Health Bd.	1	11
" Insurance Com.	1	
" Labor Bur.	1	
" Polit. Science Assoc.		1
" Treas.	1	
" Univ.	1	7
Middlebury Coll.		2
Miller, W.		1
Milwaukee Chamber of Com.	3	
" City Service Com.	1	2
" Pub. Lib'y		4
" Pub. Muse'm		1
" School Com.	23	2
Mining Bulletin	1	
Minneapolis Chamber of Com.	13	
Minn. Auditor	1	
" Geol. and Nat. Hist. Survey	1	1
" Hist. Soc.		2
" Labor Bur.	1	
" R. R. Com.	1	
" School Supt.	1	
" Univ.		1
Mission of Our Lady of the Rosary		2
Miss. Educ. Bd.	1	
Missouri Geol. Survey	7	
" Insur. Com.	1	
Modern Machinist		1

	Vols.	Pam.
Monro, T. K.	1	
Monroe, W. S.		27
Montana Agric. Bur.	1	
" St. Lib'y		1
Montclair Military Acad.		1
Montevideo Pub. Instr. Supt.	1	
Moore, V. K.	6	
Morgan, Appleton	1	
Mortonstein, J.		7
Mt. Auburn Cemetery		1
Mt. Holyoke Coll.		1
Mower, M.		1
Muhlenberg Coll.		1
Mundorff, G. T.		1
Municipal Affairs	1	
Munroe, H. S.	3	5
Murray, T. H.		1
Nash, J. McL.	52	136
Nashville School Supt.	1	
Nassau Hospital Assoc.		2
National Civil Ser. Reform League		3
" Charities Conference	1	1
" Educ. Assoc.	1	1
" Elec. Light Assoc.	3	
" Florence Crittenton Mission	1	2
" Herbart Soc.		3
" Sound Money League		4
" Temperance Soc.	5	10
Nazareth Chronicle		1
Nebraska Labor Bur.	1	
" Publ. Inst. Supt.	1	
" Transp. Bd.		1
Nelson, C. A.	8	18
" W.	1	
Nevada Surveyor-Gen.		3
" Univ.		1
Newark Educ. Bd.	1	
" Free Publ. Lib'y		5
Newberry, J. S., fr. his Library	268	
News, The	1	
Newton Free Lib'y		1
New Amsterdam Eye and Ear Hospital		9

	Vols.	Pam.
New Brunswick Sch. Supt.		2
New England Anti-Vivisection Soc.		10
" Zoöl. Club		7
New Hampshire Insur. Com.	1	
" Legislature	28	
New Haven Educ. Bd.		33
New Jersey Adj.-Gen.	1	
" Ass'ors Bd.	1	1
" Bank Com.	1	
" Educ. Bd.	8	
" Hist. Soc.		3
" Labor Bur.	2	
" Health Bd.	1	
" Qua'rmaster	1	
" St. Geologist	2	1
" Treas.	1	
New Mexico Pub. Instr. Supt.		1
New Palz Normal Sch.		1
New Panama Canal Co.		2
New So. Wales Agric. Dept.		1
" Geol. Survey	12	18
" Roy. Soc.	1	
N. Y. City Artists' Fund Soc.	1	19
" Babies' Hospital		9
" Bar Assoc.	1	
" Civil Ser. Com.	1	1
" Charity Organiz. Soc.	1	3
" Church of the Ascension		1
" Coffee Exchange		10
" Coll. Settlem't Assoc.		5
" Coll. Ref. Dutch Ch.	1	29
" Common Council	255	
" École gratuite		7
" Educ. Bd.	2	
" Fifth Ave. Pres. Ch.		5
" Fire Dept.		1

	Vols.	Pam.
N. Y. City Free Home for Young Girls . .		8
" German Hospital . .		7
" Home for Incurables .		10
" Inst. for the Blind . .		4
" Leake and Watts Home	2	
" Lutheran Hospital Assoc. . .		4
" Lying-in Hospital .		2
" Metrological Obs. . .	2	
" Metropolitan Museum .		1
" No. Eastern Dispensary		1
" Orphan Asylum . . .	2	3
" Produce Exchange . .	1	
" Property Defence League . .		8
" Public Charities. . .	25	
" Republican Club . .	1	
" R.C. Orphan Asylum .		10
" University Club . .	1	
" Working Girls' Vacation Soc. .		15
" Y. W. Settlement .		2
N. Y. St. Arbitration Bd.	1	
" Asylum for Idiots. . . .		47
" Bank Supt. .	2	
" Charities Bd. .	2	3
" Civil Ser. Com.	1	
" Coll. of Forestry		1
" Governor . .	1	
" Health Bd. .	2	
" Historian . .	3	1
" Insurance Com.	2	1
" Juvenile Asyl.		1
" Labor Bur. .	1	
N. Y. St. Ladies' Union Relief Assoc.		3
" Library . . .	30	25
" Lunacy Com. .	1	
" Museum . .	1	
" Prison Supt. .	1	
" Pub. Instr. Supt		1
" Reformatory .	2	
" Sec. of St. . .	26	
" Soc. for Prevention of Cruelty to Animals		2
" University . .	9	
N. Y. All Souls' Ch. .		12
" Architectural League . . .	4	
" Assoc. f. Improv. the Condition of the Poor .		2
" Assoc. f. Relief of Aged Females . . .		1
" Authors' Club .	1	
" Calvary Parish .	1	
" Cancer Hospital		10
" Catholic Protectory . . .	2	10
" Century Assoc. .	1	1
" Charities Directory	1	
" Ch. of the Incarnation . . .		1
" City Club . . .	1	
" Civil Ser. Reform Assoc. . . .		2
" Coll. of Dentistry		1
" Cotton Exchange		6
" Day Nursery . .		2
" Diet Kitchen .		1
" Dispensary . .		9
" East Side Home		6
" Engineers' Club.	1	
" Five Points Home		10
" Free Circulating Lib'y . . .		1
" Friendly Aid Soc.		1
" Friends Employment Soc. . .		2
" Gen. Memorial Hospital . .		1
" Gen. Soc. Mechanics . . .	2	9
" Hebrew Infant Asyl. . . .		3
" Hist. Soc. . .		1

	Vols.	Pam.
N. Y. Hospital Sat. and Sun. Assoc.		1
" House and Home of Industry		1
" House and Sch. of Industry		2
" House of Mercy		2
" House of St. Giles		6
" House of the Annunciation		4
" House of the Holy Family		1
" Infirmary f. Women		12
" Infirmary Medical Coll.		2
" Inst. f. Deaf and Dumb		1
" Journal	1	
" Law School		1
" Legal Aid Soc.		5
" Lisa Day Nursery		5
" Little Mothers		7
" Magdalen Benev. Soc.		30
" Masonic Hall Asylum	2	8
" Memorial Hospital		2
" Mercantile Lib'y		3
" Metal Exchange	5	2
" M. E. Church Home	1	24
" M. E. Deaconess Home		14
" M. E. Hospital	1	2
" Metropolitan Throat Hospi'l		9
" Microscopical Soc.	1	
" Midnight Mission		5
" Mothers' Home of the Sisters of Misericorde		10
" Mothers' and Babies' Hospital		1
" Oesterreich. Gesellschaft		1
" Post Graduate Hospital		13
" Post Graduate Med. Sch.		1
" Pres. Home f. Aged Women		28
" P. E. Diocese		1
N. Y. Provident Loan Soc.		6
" Sanitarian for Hebrew Children		1
" Sheltering Arms		1
" Sisterhood of Good Shepherd		20
" Soc. f. Prevention of Cruelty of Children		2
" Soc. f. Relief of Ruptured and Crippled		35
" Soc. f. Relief Widows of Medical Men		9
" Soc. f. Suppression of Vice		1
" Society Lib'y		2
" Trade School		4
" Training Sch. f. Deaconesses		4
" Union Theol. Sem.		1
" United Hebrew Charities		4
" University Club	1	
" Univ. Settlement Soc.		1
" West End Exchange		2
" Willard Hospital		1
" Women's Educ. and Indust. Union		2
" Yacht Club		1
" Y. M. C. A.		2
" Y. W. C. A.		1
New Yorker Staats Zeitung		1
New Zealand Statistics	1	
No. Car. Health Bd.	1	3
" Labor Bur.	1	
" R. R. Com.	1	
" Treas.		1
" Univ.		1
No. Dakota Agric. Dept.	1	
" Pub. Instr. Supt.	2	
Northampton City Clerk	1	
Northwestern Univ.	1	2
Nova Scotia Inst. of Sci.		1
" Mines Dept.		1
" Parliament.		13
" S'pt. of Educ.		1

	Vols.	Pam.
Oberlin Coll.		7
Ohio Archæol. Soc.	6	1
" Auditor	1	
" Bar Assoc.	1	
" Factory Inspt.	1	
" Health Bd.	2	5
" Labor Bur.	1	
" St. Charities Bd.		8
" St. Univ.		2
Ohly, C. H.	7	5
Oklahoma Pub. Inst. Supt.		1
Olivet Coll.		1
" Memorial Home		1
Ontario Agric. Dept.	4	1
" " Sch. of Mines		1
Open Window, The		4
Oregon Tax Com.		2
Osborn, H. F.	10	
Ottawa Naturalist	3	
Outdoor Recreation League		3
Oxford Univ. Obs.		3
Pacific Univ.		2
Padova "	2	1
Paris Pub. Instr. Min.		5
Paris Herald		2
Parish, Saml. L.	1	
Park Coll.		2
" " Hist. Club		2
Partridge, W. T.	8	
Peabody Home		12
" Institute	1	2
Peace, Katherine R.	1	
Pellew, C.	18	
Penn. Coll.	1	
" Pub. Instr. Supt.	1	
" Sec. of St.	3	
" St. Coll.		20
" St. Lib'y	23	22
" Univ.	11	35
Peoria Pub. Lib'y		1
Perrin, R. S.	3	
Phi Beta Kappa Alumni		1
Phi Gamma Delta	1	
Phi Kappa Psi	1	
Philadelphia City Inst.		1
" " Trusts	1	
" Com. Museum		4
" Contemporary Club		1
" Controller	1	
" Free Lib'y		3
Philadelphia Jewish Foster Home.		1
" Mercantile Lib'y		1
" T-Square Club	1	
" Text-Book Assoc.	1	
Philafrican League		6
Phillips, P. L.		1
" Acad.		1
Pierce, R. M.		1
Pine, J. B.	2	
Pittsburg Chamber of Com.	2	
Plainfield Educ. Bd.		1
Planten, J. R.	18	9
Political Nursery		18
Porto Rico Educ. Bd.	1	
Post-Graduate, The		2
Pott, W. H.		2
Pratt Inst.		3
Prince Edwards Island Gen. Assembly	2	
Princeton Theol. Sem.		2
" Univ.	2	5
P. E. Church in the U. S.	1	
Providence Auditor	1	
" Pub. Lib'y		7
" Sch. Com.		13
Purdue Univ.		5
Queens Coll.	1	
Rawles, W. A.	1	
Redderoth, A. C.	1	
Reform Club Sound Currency	3	22
Revue Retrospective	11	
Rhode Island Charities Bd.		16
" " Educ. Bd.	6	
" " Health Bd.	13	
" " Hist. Soc.	2	2
" " R. R. Com.	1	
Rice, C.	1	
Richardson, L. J.		1
" A.	1	
Richfield Springs High Sch.		1
Richmond Co. Soc. Prevention Cruelty to Children		4
Ries, H.		1
Ripon Coll.		1
Riverview Acad.		1
Roberts, Ja. A.	1	

	Vols.	Pam.
Robinson, Charles	2	
" J. H.	6	
Rochester Chamber of Com.		1
Roelker, A.	3	
Rome Min. of Agric.		5
Rose Polytechnic Inst.		1
Rosenbach, A. S. W.		1
Ross, H. W.		6
" Ja.	3	
Royal Dublin Soc.	2	
Royal Soc. of L.	1	
Russia Finance Min.	18	
" Mines Dept.	1	
" Statistics Min.		3
Rutgers Coll.		1
St. Agnes Day Nursery.		2
St. Andrew's Convalescent Hos'l		1
" Soc. of N.Y.		1
St. Bartholomew's Soc.	1	
St. Christopher's Hospital		1
St. Francis' Hospital		14
St. George's Church	7	
" Soc. of N. Y. City	3	
St. Johnland Soc.		24
St. John's Guild		10
" Coll.		1
St. Joseph's Home for the Aged		1
St. Louis Architect Club	1	
" " Lib'y		1
" Pub. Sch. Com.	2	
" Univ.		1
St. Mary's Female Hospital		4
" Free Hos'l		3
St. Michael's Hospital		1
" Ch.		4
St. Olaf Coll.		2
St. Peter's Hospital		1
St. Petersburg Botan. Garden	1	
" Finance Min.		1
" Univ. Lib'y		9
St. Stevens School		1
St. Thomas Ch.		10
St. Xavier Coll.		1
St. Zitas Home		2
Salem Publ. Lib'y		3
Salt Lake Coll.		1
" Health Dept.		4
Salvator, Prince Ludwig	2	
San Francisco City Clerk	1	
" Pub. Lib'y		2
" " Sch. Com.	2	
Santa Clara Coll.		1
Santiago Inst. Nacional	3	
Saranac Laboratory		2
Sargent, F. P.	1	
Saxony Min. of the Interior	1	
Schurman, J. G.	1	
Scranton Pub. Lib'y		1
Seaman, A. P. W.		1
Seattle School Com.		6
Seligman, E. R. A.	157	323
Settna, Framjee H.	1	
Sewall, Frank		1
Shearman, J. G.		310
Sherwood, G. F. T.		1
Shield, The	1	
Silk Assoc. of Am.	4	6
Simkhovitch, W. G.	1	
Simonson, G.	4	4
Simpson, M.	1	
" W. K.		7
Smith, E. M.	1	
Smith Coll.		1
Smithsonian Inst.	14	4
Society for Promotion of Agric. Sci.		1
" Hist. of Germans in Maryland		1
" of Colonial Wars	1	
" of the Army of the Potomac		10
Sotheran & Co.	3	
So. Dakota Auditor	1	
" Normal Sch.		1
" Univ.		1
So. Orange Pub. Lib'y		1
Southern Educational Journal		7
Spirit of Missions		1
Spokane Pub. Sch. Com.		5
Springfield Lib'y Assoc.		4
Stockholm Pub. Lib'y	2	1
Stoeckl, Mr. and Mrs. C.	1	
Sturgis, Russell	2	
Stuttgart Tech. Hochschule		2
Stuyvesant, Rutherford	1	

	Vols.	Pam.
Sullivan, G. H.	138	
Swarthmore Coll.		1
Swift, M. I.	1	
Swiss Benevolent Soc.		3
Sydney Univ.	1	
Syracuse Central Lib'y		1
" Educ. Bd.		1
" Inst. f. Feeble-Minded Children		1
Tabor Coll.		1
Tallack, W.	1	
Taylor, E. R.	1	
Teachers Coll.		68
" Sanitary Bulletin		5
Technic, The		8
Technograph, The	1	
Temperance Truth	1	
Tenicheff, Prince W.	1	
Tenn. Univ.	1	5
Tewksbury Almshouse		1
Texas Acad. of Sci.		2
" Hist. Assoc.	1	1
" Pub. Instr. Supt.	2	
" Univ.	1	1
Thacher, J. B.	1	
Thomas, E.	3	2
Thomson Electric Welding Co.		1
Toledo Sch. Supt.		1
Toronto Astron. and Phys. Soc.	1	
" Pub. Lib'y		1
" Univ.	1	5
Torrey Club	16	
Townsend, T. S.	1	
Trackmen's Advance Advocate		1
Trask, Spencer	1	
Trenton Pub. Instr. Supt.	4	
Trinity Church Wardens	2	
" Coll., Hartford		1
" Univ., Toronto	1	
Tübingen Univ. Lib'y		2
Tufts Coll.	1	1
Typographical Union		3
Underwood, L. M.	14	
United Hatters of No. Am.		1
" Kingdom Geol. Sur.		1
U. S. Agric. Dept.	15	87
" Bur. of Am. Republics	2	25
U. S. Civil Service Com.	2	
" Congress	119	
" Educ. Bur.	5	
" Ethnology Bur.	13	
" Fish Com.	2	
" Fur Seal Com.	4	
" Geol. Survey	4	7
" Interior Dept.	2	17
" Interstate Commerce Com.	4	
" Labor Bur.	2	6
" Land Office	5	7
" Life Saving Ser.	1	
" National Museum	2	
" Patent Office	8	
" State Dept.	10	12
" Supervising Architect	17	3
" Supt. of Doc.	115	90
" Treas. Dept.	10	65
" Volta Bur.	1	5
" War Dept.	22	8
Uruguay Pub. Instr. Supt	1	
Utah Agric. Coll.		1
" Pub. Inst. Supt.	1	
" Univ.		1
Utrecht Univ. Lib'y		38
Valentine, Mrs. R.	6	
Van Ingen, Mrs. J. J.	3	
Vassar Brothers Inst. Lib'y		3
Veeder, M. A.		2
Verulam Soc.	1	
Venezuela Arbitration Com.	7	
Vermont Agric. Ex. Station	1	5
" Dairymens Assoc.		1
" R. R. Com.	1	
" St. Lib'y	9	7
" Treas.	1	2
" Univ.		1
Victoria Mines Dept.	2	1
" Univ.	1	
Villanova Coll.		1
Virginia Univ.	1	6
Wabash Coll.		1
Wadsworth, M. E.		17
Wandell, S. H.	1	
Ward, E. G.	22	48
Washburn Coll.		2
Washington Biol. Soc.		5
" Univ.		1

	Vols.	Pam.
Washington St. Health Bd.		10
Waterman, H. L.	1	
Weir, J.	1	
Wesleyan Univ.		2
West, Max	1	
West Va. Free Sch.		3
" Univ.		1
Westchester Home for Destitute Children		18
Western Electrician	2	
" Reserve Univ.	1	1
White, Horace	2	
Whitman Coll.		1
Wien Univ.	1	5
Wilcox, Hamilton, Estate of	134	29
Willett, Mrs. C. M.	1	
Williams Coll.		3
William and Mary Coll.	7	
Winona Health Bd.		1
Wisc. Acad. of Sci.	2	
" Adj.-Gen.		1
" Forestry Com.		1
" Health Bd.	1	
" Hist. Soc.		37
" Labor Bur.	1	
" Treas.	1	
Wisc. Univ.	1	4
Wittenberg Coll.		1
Wofford Coll.		1
Worcester Acad.		2
" City Clerk	1	1
" Pub. Lib'y		3
" Sch. Supt.		3
Writt, H.	1	
Wurzburg Univ. Lib'y		5
Wyoming Agric. Ex. Station		3
" Charities Bd.		1
" Pub. Instr. Supt.	2	2
" Sec. of St.	2	
" Univ.		1
Yale Univ.	5	11
" Univ. Obs.		1
Yeaman, Geo. W.	1	
Yorkshire Coll.	1	1
Zabrisky, A. S.	1	
Giver Unknown	108	230
	5582	8426
Chas. Kohlman & Bros., N. Y. Herald, 1857–1889.		

THE GYMNASIUM

REPORT OF THE DIRECTOR

FOR THE YEAR ENDING JUNE 30, 1899

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report on the work of the Gymnasium Department for the year 1898–99.

The staff has been as follows:

WATSON L. SAVAGE, A.M., M.D.,	*Director and Head of the Department.*
GUSTAV H. BOJUS	*Instructor.*
MARCELLUS T. HAYES, LL.B.	*Secretary and Instructor.*
CHARLES HOLROYD	*Instructor in Swimming.*
WADE H. HAYES	*Clerk.*
P. CARCIOFINI	*Instructor in Boxing.* (Paid by the sudents.)
M. GOUSPY	*Instructor in Fencing.* (Paid by the students.)

The gymnasium was opened on the first day of the college year at 10.30 A.M., Monday, October 3, 1898, for the use of the officers, students, and alumni of the University. At 11.30 the first lecture was given by the director to the Freshman class upon the gymnasium, its use and abuse, followed by a series of lectures upon general hygiene to all the classes having the required gymnastics. This course covered a period of two weeks, during which time the students were getting located and equipped for the regular work of the Department. All the arrangements for opening the new Department, assigning the lockers, examining the men, etc., had been so carefully thought out in advance and the wants anticipated, that the opening was accomplished without friction, and as a matter of course without particular incident. The gymnasium being a new feature in Columbia life, we necessarily had to meet and dispose of new questions and situations; but as no very complex problems arose, those that did appear were settled in a conservative manner by the officers of this Department.

Four hundred and fifty-four students were enrolled in this Department for regular required attendance, comprising the members of the Freshman and Sophomore classes of the College, and the first- and second-year classes of the Schools of Applied Science, except those members of these classes who had degrees from other colleges, special students, and a very few excused for physical inability. These students came to the gymnasium twice a week for one hour's time, and the period allowed was found to be very short to change the clothes twice, exercise, and take a bath. Notwithstanding the limited time allowed, the amount of work accomplished was very satisfactory. A careful record was kept of the attendance of each man and a report of the same given to the respective Deans. All reasonable means have been adopted to make the work interesting and profitable.

The plan of the work for the year was both educational and practical, and, as will be seen from the detailed report below, we gave the students as much as was possible in the time allowed. The course is planned for two years, and at the end of this period I think we can safely claim the men will have as good knowledge of the subject as could be given in the time spent in the gymnasium, as well as the benefit of the exercise itself.

One of the difficulties we had to contend with was the clashing of hours in such a way that the students could not get time for their luncheon; making it necessary to open an extra hour in the afternoon to these students, and the work at this hour could not be done as well owing to the fact that the gymnasium was at that time in use by all the teams in training, thus diverting the attention from their own work to that of others.

Notwithstanding all of this, our records show a general physical improvement among the students who have attended with any degree of regularity. They have gained in weight, increased the girth measures of their muscles, and have improved their strength as shown by our strength-testing instruments. Of course, this Department does not take the credit for all the physical advancement that is indicated by our records. We make suitable allowances for the natural growth and increase of strength of a healthy young man. But our records point out this significant fact — that in cases of young men of equal health, those who have done their work well present a better form and show a finer condition than those who have been more or less indifferent. A marked illustration of this fact is the case of Mr. J. P. Wylie of the Freshman class, whose chest gained in girth 3 inches, arms 1 inch, legs 1 inch, and a net gain of 12 pounds in weight. His first strength test was 590, and his last 1161, or a gain in strength units of 571, equal to 1254 pounds. We have other cases where the strength unit has more than doubled. Optional classes were organized for the benefit of the students who used the gymnasium in the afternoons. These classes were conducted on Monday, Wednesday, and Friday afternoons from 4.30 to 5.30. Quite a number of students and others took advantage of the work here presented; each class in number averaging from thirty to fifty. This work was carried on for six months, with evident success, as the attendance did not appear to fall off.

All students, who have so desired, have been taught elementary wrestling, boxing, fencing, and swimming, the four arts of self-preservation, besides a variety of dumbbell movements, wand drills, club exercises, and apparatus work. Every member, so far as I know, of the present Sophomore class can swim, and I would recommend that to learn to swim be one of the requirements placed upon each member of every Sophomore class, and be made one of the tests before the Sophomores finish their compulsory work in the gymnasium. All of the first-year men have been taught to swim, with the exception of three or four members who did not offer themselves for the course.

Six hundred and thirty-five physical examinations, including the measurements of the body, strength tests, examinations of the heart, lungs, etc., have been made. These examinations include all students representing Columbia University in athletics, the members of the classes taking the required work, and any other member of the University presenting himself at the office for the purpose.

Our fifty men making the best physical tests competed in the inter-collegiate tests for the strength trophy, scoring an average of a little over 1000 points, thereby winning second place among the colleges. All of the men taking a second trial show an improvement over their first tests of from twenty-five to seventy-five per cent.

Of these examinations, 234 had some slight deviation of the spine to one or the other side.

One hundred and ninety either wore glasses or were deficient in vision.

Hearing could not be tested owing to the noise about the office.

Seven had unsatisfactory lung conditions, and forty had heart complications which would make it unwise to take part in severe athletic contests.

Eighteen have hernia, but for the most part not severe and protected with trusses; all advised about their work, and one forbidden to hurdle or high jump until cured; by action of the Committee on Athletics.

No very severe injury can be charged to the gymnasium, although there were some minor ones that at the time seemed to be more serious than they turned out to be. Several accidents of a more serious nature were reported and repaired which were the result of class rushes and fights.

There were held during the winter a series of indoor contests in the following events:

Gymnastic. — Horizontal bar, parallel bars, vaulting horse, flying rings, tumbling, wrestling, and the all-round championship going to the man scoring the greatest number of points in all the events.

Athletic. — Forty-yard dash, running high jump, pole vault, high and low hurdles, putting the shot, one lap dash on the running track, two laps, four laps, and eight laps: the all-round champion being the man scoring the most points in all these events.

Early in the winter a Gymnastic Association was formed by the students, and their first meet was a joint exhibition with Princeton and Yale in the Columbia Gymnasium, and although our men were but just organized they made a very creditable showing, and the entertainment proved a success artistically, socially, and financially.

The next entertainment of note was the final examination and demonstration of the classes taking the required work and this, like the other, passed off well in spite of the weather, which was very stormy, and was criticised by an old experienced teacher in this work as being "most remarkable," and a display of the greatest variety and range of work he had ever seen put on in one night.

Our third public demonstration was given on June 3d, at a time when but few of our regular workers were available, but a goodly audience was present and a very interesting hour was spent in the gymnasium proper, followed by an hour's exhibition in the swimming pool. At the closing examination on May 7th, a banner, the gift of the director, was presented by President Low to the class doing the best work of the evening in the opinion of the three judges selected for the purpose, two of whom were Columbia men, gymnasium directors, and the third an expert teacher of gymnastics. This award was made to the Class of 1902, Applied Science.

At the inter-collegiate meet held at the New York University, the men from Columbia made an excellent showing and won one second and one third prize, notwithstanding the fact that their experience in this line was confined to only one season's training, and three men who had shown considerable promise were from one reason or another unable to take part.

Basket- and hand-ball tournaments were held during the winter, in which the various classes took part, as well as individuals, and proved a source of considerable interest as well as benefit in the way of healthful exercise.

The crews upon application were given a specially prepared course of exercises for preliminary training, and when they went into quarters, were provided with a suitable diet regulation which I hope has been of service to them.

The track team also applied for diet regulations when they went to their quarters at Williamsbridge. The Department has endeavored to impress it upon the students that they should always be in training and avoid all excesses not only when in active training for some particular contest, but at all times.

I am frequently consulted by the students in regard to their health and in minor cases of illness and injury, and all such cases have been treated free of charge. The number of surgical cases needing dressing have numbered upward of twenty-five.

The *Gymnasium Guide*, prepared in the early part of the year, has been of great service, containing, as it does, an epitome of the rules for the care of the body, the rules governing athletics in the University, etc. This book is given to every student taking a physical examination, with a copy of his measurements written therein; and, when student so desires, a special course of exercise is prescribed in their *Guide*.

The reports of all games and contests are kept in the office of the gymnasium in duplicate file, and these reports are copied into a book of permanent records, which is available as a ready reference, at any time of the day during the hours the gymnasium is open, to student or officer of the University.

The Department has in its charge forty-four (44) flags and trophies in the form of banners, flags, etc., many of which are becoming worn and frayed. For the purpose of preservation and the continual display of these trophies, we are very much in need of a proper case large enough to group them well and keep them from dust, under lock, where they will serve as a stimulus to men who are giving much of their time and strength to uphold the good name of Columbia on land and water, and as an encouragement to others. In addition to these there are a number of cups and silver trophies which it would also be well to have displayed in safe keeping in the gymnasium. A case for this purpose is also needed.

The following facts and figures make up the statistics of this Department for the first year's work:

Number of lockers assigned.....................1384

Attendance optional (not including the required work). As follows:

Gymnasium.—Total count by the month, beginning October 20th.

October	1,680
November	3,955
December	3,384
January	3,718
February	4,665
March	4,498
April	1,138
Total	23,038

Swimming Pool.—Total number for the year........25,000

Hand-Ball Courts:

October	439
November	1,139
December	1,416
January	1,839
February	1,602
March	2,040
April	1,514
Total	9,989

Visitors:

October	483
November	1,064
December	1,075
January	1,377
February	1,690
March	1,926
April	1,835
Total	9,450

The number of men who went into active training in the gymnasium during the winter to represent the University on athletic teams was upward of 250.

The number of men taught to swim was seventy-four.

The number of exercising drills given on the gymnasium floor from October 10th to April 7th was as follows:

Free-hand drills	24	of 44	movements each.
Dumbbell "	19	" 48	" "
Club "	18	" 48	" "
Iron wand "	21	" 32	" "
Bar bell "	20	" 40	" "

Single and stick fencing	18 lessons.
Wrestling	18 "
Gymnastic games taught	8 "

In addition to the above mass work, the classes were all divided into squads of from twenty to thirty men, according to their strength and ability to handle their bodies, making, before the season was past, four grades of work. These squads were given exercises in "heavy gymnastics"; that is, on the bars, rings, horse, buck, tumbling, climbing, etc., where the apparatus used is the fixed part and the body the movable. This work is very valuable in teaching men the handling of their own weight and giving them balance and self-control. This work will be carried further with the men in their second year.

In addition to the direct benefit the gymnasium has been to the individual students, it has had a very wide and powerful influence in bringing the men together from all the departments and classes on one common ground, and through a broader acquaintance thus gained the University bond is made much stronger and drawn closer together. This, in time, of necessity must develop a greater loyalty for Columbia, and make through the association of men the degree from this University more valuable through the influence this acquaintance must exert upon the after life of the men.

Lastly, the gymnasium and its entertainments have to my certain knowledge been direct factors in guiding the decision of both boys and parents in their choice of a college home.

Respectfully submitted,
W. L. SAVAGE,
Director.

COMMITTEE ON ATHLETICS

REPORT FOR THE YEAR ENDING JUNE 30, 1899

Hon. Seth Low, President,
Columbia University:

The Committee on Athletics have the honor to make the following report as the result of the labors of this committee during the year just past. Eleven regular meetings were held at which the full committee were, with but rare exceptions, present:

It being the first year under the new rules and regulations governing athletics, it required a great deal more labor on the part of the committee than will be necessary another year: first, to bring the student body into a full knowledge of the rules; second, to convince them that these rules had been framed in the true interests of real college athletics; third, to convince them that they must be lived up to in every respect.

Under the first head there were printed copies of the rules, and blank applications and reports with the rules printed upon the back. These rules and applications were posted upon the bulletin board, mailed to every captain and manager known to the committee, and kept at the rail office in the gymnasium, for free and convenient distribution. After all this was done the committee, through its secretary, kept the various organizations and individuals reminded and instructed as to their duties and the necessity of carrying out these regulations. There were some cases of carelessness on the part of the students, but for the most part before the end of the year the rules were well in force and we look forward to a much easier course in the future. Only one case seemed to require enforcing by discipline, and that was such a flagrant and persistent disregard of the rules that it could not be excused and the usefulness of the committee continued. It is not necessary to enter into detail, as you have had all the facts before you during the winter. Only permit the committee to say that the effect of that action changed at once and completely the attitude of the students toward the committee and its rules, and resulted in making the work of the committee much easier.

It has seemed wise in some instances to be somewhat lenient where the strict enforcement would have caused severe hardship; but, when this has been done, there has been in each instance a good reason leading up to that condition, and, on the other hand, we have provided for the future in such a way that we believe the effect will be very beneficial next year.

The committee has held eleven meetings, and passed upon the schedule of sixty-five games. It has been asked to decide one class matter of representation, and has been frequently consulted on matters regarding athletics by the students. We believe that through the efforts of this committee the standing of the men participating in athletics throughout the University has been materially raised, and that instead of athletics being a burden which prevents students from doing their regular college work, they have been and will continue to be a direct stimulus to those students who are fond of them. By bringing our influence to bear upon the managers and captains of teams we expect, through them, to keep delinquent students up to their work.

The work of the committee has also had a very beneficial effect upon the finances of the various athletic organizations, and while it has not seemed wise to enforce this rule to the letter, many old debts have been cleared away, others provided for in the near future, and no unusual or new ones contracted.

Through the work of this committee and the gymnasium department, all reports of games and contests are received, recorded, and kept on file, in order to preserve the history of the athletic life of Columbia University.

Two slight modifications of the rules, as first laid down, seemed advisable, more to make the rules clearer and more definite than to change their meaning. A copy as amended I herewith enclose.

Respectfully submitted,
COMMITTEE ON ATHLETICS:
J. F. KEMP,
F. R. HUTTON,
W. L. SAVAGE, *Chairman.*

P. S.—The committee would like to suggest that it is within their power under the provisions of the rules to bring the influence of the teams themselves to bear upon students who may be permitting their college work to run behind by failing to maintain the necessary standard of class work. It would be at once apparent that where the rules preclude a delinquent student from participating in athletic events, his associates, at the request of the committee, can wield great influence over him for their own sake.

SECTION II.

*1. Schedules for all games must be submitted to the Committee on Athletic Sports and approved by them.

*2. A similar approval is required in the case of every individual intending to represent Columbia University in any single contest.

SECTION III.

No athletic association or class of the University shall enter a team or an individual in any public athletic contest so long as there is any outstanding indebtedness against the Association or athletic interests thus represented.

These rules shall go into effect July 1, 1898.

Dr. W. L. SAVAGE, *Chairman.*
Prof. J. F. KEMP,
Prof. F. R. HUTTON.

*Amended March 15, 1899.

TREASURER'S STATEMENT OF EDUCATIONAL RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDING JUNE 30, 1899

CURRENT RECEIPTS

Receipts from—		
Rents		$398,816 66
Fees :		
Matriculation Fees	$ 4,210 00	
Tuition Fees	326,285 30	
Diploma Fees	10,475 00	
Gymnasium Fees	9,478 00	
		350,448 30

MISCELLANEOUS

From Barnard College, for Electric Current Supplied	$1,053 76	
Sale of Books—Life of Barnard.	15 08	
Sale of Catalogues and Records.	105 00	
Sale of Books, School of Medicine	11 50	
Gift for General Purposes of the University	250 00	
		1,435 34
		$750,700 30

CURRENT EXPENSES

ITEMS PROVIDED OUT OF THE GENERAL FUNDS OF THE CORPORATION

I. General Expenses.			
Business Administration		$18,764 14	
Educational Administration (less gifts)		62,693 00	
Buildings and Grounds		100,489 80	
Gymnasium		10,487 59	
Chapel		2,040 00	
Library (less receipts)		46,121 51	
Emeritus Officers		4,275 00	
Fellowships, Scholarships, and Prizes:			
Less Income of Moffatt Scholarship Fund	$ 90 00		
Less Income of Schermerhorn Fellowship Fund	225 00		
Less Income of Stuart Scholarship Fund	267 50		
		20,037 00	
			$264,908 04
II. Philosophy, Philology, and Letters.			
English Departments		$27,631 55	
Germanic Languages and Literatures (less Income of Gebhard Fund)		11,949 36	
Greek		12,549 03	
Latin		9,911 15	
Music (less Income of Center Fund and Sale of Instruments)		859 92	
Oriental Languages (less gift)		7,580 68	
Philosophy and Education		9,750 00	
Psychology		5,999 97	
Romance Languages and Literatures		15,802 00	
			102,033 66
Carried forward			$366,941 70

Brought forward		$366,941 70
III. Natural and Exact Sciences.		
Architecture (less gift)	$23,880 49	
Astronomy	10,296 00	
Botany	5,899 54	
Chemistry (less gifts and receipts).	35,800 00	
Engineering Departments (less gifts and receipts)	38,890 28	
Geology and Palæontology	9,899 52	
Mathematics (less contribution from Barnard College)	15,315 93	
Mechanics	10,654 91	
Metallurgy	7,899 28	
Mineralogy (less gift)	5,799 99	
Mining (less gift)	10,160 31	
Physics	20,495 81	
Zoölogy (less Income of DaCosta Fund)	9,777 28	
		204,769 34
IV. School of Law		35,284 24
V. School of Political Science (less contribution from Barnard College)		52,084 48
VI. School of Medicine.		
Anatomy (less receipts)	$21,192 98	
Physiological Chemistry (less receipts)	10,938 49	
Clinical Instruction	11,600 00	
Materia Medica and Therapeutics.	7,529 94	
Obstetrics and Gynecology	13,766 75	
Pathology (less receipts)	30,073 49	
Physiology (less receipts)	13,239 27	
Practice of Medicine	12,300 00	
Surgery	14,326 95	
		134,967 87
		$794,047 63
Amount added on account of interest as per resolution of the Trustees, adopted May 1, 1899.		10,000 00
Interest on cost of improvements at College of Physicians and Surgeons		4,005 00
		$808,052 63

SUMMARY

Deficiency		$57,352 33
Provided for as follows:		
Receipts after closing of Treasurer's books	$6,557 00	
General Guarantee Fund, estimated	26,000 00	
Special Guarantee Fund, estimated	24,795 33	
	$57,352 33	$57,352 33

OTHER OUTLAYS PROVIDED FOR BY THE INCOME AND ACCUMULATIONS OF TRUST FUNDS FOR SPECIAL PURPOSES

Departmental :		
Center Fund for Music.......	$5,015 08	
DaCosta Fund for Zoölogy....	5,022 25	
Gebhard Fund for German....	800 00	
		$10,837 33
Library, for Purchase of Books :		
Avery Architectural Collection	$4,094 72	
Barnard Library Fund........	3,345 19	
Cotheal Fund................	407 72	
Drisler Classical Fund........	751 31	
		8,598 94
Fellowships, Scholarships, and Prizes :		
Barnard Fellowship..........	$445 50	
Bennett Prize................	40 00	
Bunner Medal...............	24 75	
Chanler Historical Prize......	45 00	
Columbia Fellowship.........	1,300 00	
Loubat Prizes...............	109 50	
McKim Fellowships..........	2,000 00	
Moffatt Scholarship..........	90 00	
Pulitzer Trust Scholarships....	2,410 00	
Schermerhorn Scholarship.....	225 00	
Schiff Fellowship.............	600 00	
Stuart Scholarship............	267 50	
Trowbridge Fellowship........	500 00	
Tyndall Fellowship...........	648 00	
Clark Scholarship, School of Medicine..................	670 00	
Harsen Prize for Clinical Reports, School of Medicine...	250 00	
Harsen Examination Prizes, School of Medicine.........	1,175 00	
Harsen Prize Expenses, School of Medicine................	61 00	
Smith Prize, School of Medicine	100 00	
		10,961 25
Carried forward...............		$30,397 52

Brought forward		$30,397 52
Sloane Maternity Hospital:		
Income of Trust Funds forwarded		12,500 00
Vanderbilt Clinic:		
Income of Trust Funds forwarded		5,650 00
		$48,547 52

OTHER OUTLAYS PROVIDED FOR BY RECEIPTS FOR DESIGNATED PURPOSES

Departmental:		
Anatomy, for Supplies	$1,343 25	
Architecture, for Salaries	3,000 00	
Astronomy, for Lectureship in Celestial Mechanics	1,000 00	
Chemistry, for Supplies	10,941 04	
Civil Engineering, for Departmental Appropriation	69 14	
Civil Engineering, to Replace Instruments Destroyed by Fire of July 18, 1896	551 91	
Educational Administration, for Commencement (to make good overdraft in 1897–1898,	499 19	
Educational Administration, for Lectures	950 00	
Mathematics, for Salaries (from Barnard College)	3,500 00	
Mechanical Engineering, for Mechanical Laboratory and Summer School	342 00	
Mechanical Engineering, for Special Equipment	2,255 00	
Metallurgy, for Laboratory Equipment	499 69	
Mineralogy, for Departmental Appropriation	200 00	
Mining, for Departmental Appropriation, Including Summer Class in Mining	363 62	
Music, for Departmental Appropriation	20 05	
Oriental Languages, for Salaries	500 00	
Carried forward		$26,034 89

Brought forward	$26,034 89	
Pathology, for Supplies	46 75	
Physical Anthropology, for Salaries	2,000 00	
Physiological Chemistry, for Supplies	520 45	
Physiology, for Departmental Appropriation	99 87	
Political Science, for Salaries (from Barnard College)	8,500 00	
Zoölogy, for Senff Zoölogical Expedition	4,000 00	
		$41,201 96
Library:		
Books and Binding	$ 323 47	
John D. Crimmins Collection	21 64	
James Loeb Fund	41 49	
William G. Low Fund	165 28	
F. A. Schermerhorn Fund	1,499 98	
Senff Collection in Biology	20 87	
Senff Collection in History 1897	150 59	
Special Fund 1896	393 54	
Special Fund 1898	10,558 79	
Special Fund in History 1898	2,605 38	
Special Fund for Purchase of Books in Sanskrit	48 16	
		15,829 19
Fellowships, Scholarships, and Prizes:		
Alumni Association Prize, School of Medicine	$ 50 00	
Alumni Fellowship, School of Medicine	1,500 00	
Annual Fellowship	500 00	
Antioch College Scholarship	150 00	
John D. Jones Scholarships	400 00	
Susan Dyckman Scholarship	200 00	
Seligman Prize Essay	150 00	
Toppan Prize in Municipal Law	150 00	
		3,100 00
		$60,131 15

RECEIPTS FOR PERMANENT PURPOSES

Beck Scholarship Fund and Beck Prize Fund (Remainder of Beck Legacy)	$ 7,500 00
Beck Estate, on account of residuary interest	40,000 00
Fayerweather Legacy	9,944 77
Willard B. Perkins Estate, for Architectural Scholarship	5,700 00
Abraham Jacobi Ward for Children	50,000 00
Waring Municipal Fund	100,000 00
George William Curtis Fellowship Fund	10,000 00
Dyckman Fund, for the Encouragement of Biological Research	10,000 00
Seidl Fellowship	12,000 00
Miss Catherine W. Bruce, for Dept. of Astronomy,	10,000 00
Alexander Coles, Class of '85 College	1,500 00
Seth Low, on account of Construction of the Library	150,639 32
" " interest to June 30, 1899, on advances made by the Trustees for construction of the Library	75,000 00
W. C. Schermerhorn, on account of construction of Schermerhorn Hall, final payment	8,133 18
	$490,417 27

INVESTMENT OF TRUST FUNDS

JUNE 30, 1899

Avery Architectural Fund:		
Gift of Samuel P. Avery and Mary Ogden Avery in memory of their deceased son, Henry Ogden Avery. The income to be applied to the purchase of books relating to architecture, decorations, and allied arts. Established 1890.		
$15,000 Lehigh Valley Railroad Co.'s 4½ per cent. First Mortgage Bonds, due 1940	$15,000 00	
Carried forward		$15,000 00

Brought forward	$15,000 00	
Interest in Bond and Mortgage for $20,000, on property on 82d Street, near Fifth Avenue, Borough of Manhattan, due July 8, 1900, at 4½ per cent	10,000 00	
		$25,000 00
Barnard Fellowship Fund:		
Legacy from the late President Barnard (who died in 1889) to support a fellowship to be entitled "The Barnard Fellowship Fund for Encouraging Scientific Research."		
Certificate No. 22, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage, on property on Church Street, near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent		$10,000 00
Barnard Library Fund:		
The residuary estate of the late President Barnard was left to the Trustees of Columbia College to constitute a fund under the name of "The Barnard Fund for the Increase of the Library," the income of which is to be devoted to the purchase of books, especially those relating to physical and astronomical science. But out of the income of this fund so much as may be necessary is to be applied in procuring a gold		
Carried forward		$35,000 00

Brought forward..............		$35,000 00
medal of the bullion value of not less than $200, to be styled "The Barnard Medal for Meritorious Service to Science," and to be awarded every five years on the judgment of the National Academy of Science of the United States. The medal will be next awarded in June, 1900.		
$11,000 Buffalo, Rochester, and Pittsburg Railroad Co.'s 5 per cent. General Mortgage Gold Bonds, due 1937............	$10,960 57	
$10,000 Illinois Central Railroad Co.'s 4 per cent. Bonds, due 1953......................	7,950 67	
$4,000 Series "B" Pitkin County, Colorado, 6 per cent. Funding Bonds, due..............	4,000 00	
Two Mortgage Deeds on property at Litchfield, Conn.: one for $3,500 at 5 per cent., and one for $500 at 6 per cent........	4,000 00	
$35,000 Columbia College 3 per cent. Mortgage Gold Bonds, due 1909..................	35,000 00	
	61,911 24	
Cash on hand.................	174 97	
		$62,086 21
Margaret Barnard Fund:		
The residuary estate of the late Margaret Barnard (who died in 1889), widow of the late President Barnard, was left to the Trustees of Columbia College "to augment the sum left by my late husband."		
Carried forward...............		$97,086 21

Brought forward		$97,086 21
$16,000 Columbia College 3 per cent. Mortgage Gold Bonds, due 1909	$16,000 00	
Cash on hand	231 67	
		$16,231 67
Beck Funds:		
The late Charles Bathgate Beck (who died in 1894) bequeathed the sum of $10,000 to be applied as follows: $2,000 to found one free scholarship, the income to be applied "to the free yearly tuition and education in said College of one student forever, under such terms and conditions as the rules of said College and said Trustees shall prescribe." The income of the remaining $8,000 to be used for an annual prize "to the student in the Law School who shall pass the best examination in Real Estate Law."		
Beck Scholarship Fund.		
$2,000 Lehigh Valley Terminal Railroad Co.'s 5 per cent. First Mortgage Gold Bonds, due 1940	$2,000 00	
Beck Prize Fund.		
$8,000 Lehigh Valley Terminal Railroad Co.'s 5 per cent. First Mortgage Gold Bonds, due 1940	8,000 00	
		$10,000 00
Bennett Prize Fund:		
Gift of James Gordon Bennett. The income of the fund, or a		
Carried forward		$123,317 88

Brought forward..............	$123,317 88
medal of equal value, to be given for an "essay in English prose upon some subject of contemporaneous interest in the domestic or foreign policy of the United States." Established in 1893.	
$1,000 West Shore Railroad Co.'s 4 per cent. First Mortgage Bonds, due 2361.............	$1,000 00
Bunner Prize Fund:	
Gift of friends of the late Henry Cuyler Bunner. The income of the fund to be used to provide every year "the H. C. Bunner Medal," to be given to the student who shall present the best essay on an assigned subject in American literature. Established in 1896.	
Certificate No. 29, series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage, on property on Church Street, near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent...........	$1,000 00
Center Fund.	
Gift of Mary E. Ludlow in memory of her son, the late Robert Center. The income of the fund to be applied either to the salary of a professor of music, or other instructors in music, or to fellowships or scholarships in music, or to be used in any	
Carried forward...............	$125,317 88

Brought forward		$125,317 88
one or more of these ways, or such other ways as shall in the judgment of the Trustees tend most effectively to elevate the standard of musical instruction in the United States and to offer the most favorable opportunities for acquiring instruction of the highest order. Established in 1896.		
$4,000 Belleville and Carondelet Railroad Co.'s 6 per cent. First Mortgage Bonds, due 1923	$4,574 00	
$6,000 Georgia Pacific Railroad Co.'s 6 per cent. First Mortgage Bonds, due 1922	6,885 00	
$75,000 Columbia College 3 per cent. Mortgage Gold Bonds, due 1909	75,000 00	
Bond and Mortgage on property No. 436 East 87th Street, Borough of Manhattan, due October, 1899, at 5 per cent.	5,000 00	
Bond and Mortgage on property on Douglas Street, Borough of Brooklyn, due December 31, 1909, at 5 per cent.	3,000 00	
Bond and Mortgage on property on Schenectady Avenue, Borough of Brooklyn, due July, 1899, at 5 per cent.	6,000 00	
Bond and Mortgage on property on Sterling Street, Borough of Brooklyn, due 1902, at 5 per cent.	4,000 00	
	$104,459 00	
Cash on hand	5,915 50	
		$110,374 50
Carried forward		$235,692 38

Brought forward..............	$235,692 38
Real Estate. (Uninventoried.)	
Malbone and Sterling Street Lots, Borough of Brooklyn.	
320 to 334 Flatbush Avenue, Borough of Brooklyn.	
129 West 17th Street, Borough of Manhattan.	
Chanler Prize Fund:	
Bequest of J. Winthrop Chanler, of the Class of 1847, to found an annual prize for "the best original manuscript essay in English prose on the history of civil government of America, or some other historical subject." Established in 1878.	
$1,000 St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bond, due 1933.........	$1,000 00
Columbia Fellowship Fund:	
Established by the Trustees for a travelling fellowship in the Department of Architecture, in recognition of the liberality of Mr. F. Augustus Schermerhorn, of the Class of 1868, to this Department. The fellowship is awarded in every even-numbered year. Established in 1889.	
$13,000 Lehigh Valley Railroad Co.'s 4½ per cent. First Mortgage Bonds, due 1940........	$13,000 00
Cotheal Fund:	
Gift of Mrs. James R. Swords and Mrs. Samuel Lawrence as	
Carried forward...............	$249,692 38

Brought forward..............	$249,692 38
a Memorial to their brother, Alexander I. Cotheal. The income to be used and applied to the purchase of books in the Oriental languages, or relating to Oriental countries. Established in 1896.	
Bond and Mortgage on property No. 437 East 86th Street, Borough of Manhattan, due 1901, at 4½ per cent..............	$6,000 00
Curtis Fund :	
Gift of the George William Curtis Memorial Committee to establish a fellowship in the School of Political Science in Columbia University, to bear the name and perpetuate the memory of the late George William Curtis. The holder of the fellowship to devote himself to the study of the science of government, with a special view to its application to the then existing condition of the United States, or of the State or City of New York, and to publish a monograph on some subject relating to the then existing condition of the United States, etc. Established in 1899.	
$10,000 Scioto Valley & New England Railroad Co.'s 4 per cent. First Mortgage Gold Bonds, due 1989............	$10,000 00
Carried forward..............	$265,692 38

Brought forward		$265,692 38
DaCosta Fund:		
The late Charles M. DaCosta, a member of the Class of 1855 (who died in 1890), bequeathed to the Trustees of Columbia College $100,000. Of this sum the Trustees, on October 6, 1891, set apart $80,000 for the endowment of a Chair in the Department of Biology. This sum has been increased by the profits of certain investments.		
$20,000 Central Railroad Company of New Jersey 5 per cent. Consolidated Mortgage Bonds, due 1937	$20,000 00	
$66,000 Columbia College 3 per cent. Mortgage Gold Bonds, due 1909	66,000 00	
Certificate No. 281, Series 450, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage of Hudson Building (a Corporation), on property Nos. 32 and 34 Broadway, and 69 and 71 New Street, Borough of Manhattan, due on or before November 1, 1905, at 4 per cent.	500 00	
	$86,500 00	
Cash on hand	76 83	
		$86,576 83
$20,000 of this bequest was used for fitting up the DaCosta Biological Laboratory. The surplus results from sale of securities.		
Carried forward		$352,269 21

Brought forward..............	$352,269 21
Drisler Classical Fund :	
Gift of President Low for the endowment of "The Henry Drisler Classical Fund" for the purchase of books, maps, charts, busts, and such other equipment as will tend to make instruction in the classics more interesting and effective. Established in 1894.	
Interest in Bond and Mortgage for $20,000 on property on 82d Street, near Fifth Avenue, Borough of Manhattan, due July, 1900, at 4½ per cent..........	$10,000 00
Dyckman Fund :	
Gift of Isaac Michael Dyckman in memory of his uncles, Dr. Jacob Dyckman and Dr. James Dyckman, both of the College of Physicians and Surgeons, to establish the "Dyckman Fund for the Encouragement of Biological Research," "the interest derived therefrom to be devoted annually to such object consistent with the purposes of the gift as shall be recommended by the Department of Zoölogy, and approved by the President." Established in 1899.	
$10,000 Scioto Valley & New England Railroad Co.'s 4 per cent. First Mortgage Gold Bonds, due 1989...........	$10,000 00
Carried forward...............	$372,269 21

Brought forward..............	$372,269 21
Gebhard Fund :	
Bequest of Frederick Gebhard to found a Professorship of the German Language and Literature. Established in 1843.	
$20,000 West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361........................	$20,000 00
Illig Fund :	
Bequest of William C. Illig of the Class of 1882, School of Mines. The income of the fund to be applied to the purchase of prizes to be awarded to students of the graduating class of the School of Mines who shall, in the judgment of the Faculty, have merited the same by commendable proficiency in such scientific subjects as the Faculty may designate. Established in 1898.	
Certificate No. 280, Series 450, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage of Hudson Building (a Corporation), on property Nos. 32 and 34 Broadway and 69 and 71 New Street, Borough of Manhattan, due on or before November 1, 1905, at 4 per cent........................	$2,000 00
Loubat Fund :	
Gift of Joseph F. Loubat (Duc de Loubat), for prizes to be	
Carried forward...............	$394,269 21

Brought forward		$394,269 21
given every five years for works in the English Language on the History, Geography, Archæology, Ethnology, Philology, or Numismatics of North America. First prize $1,000. Second prize $400. The prizes will be next awarded in June, 1903. Established in 1892.		
$7,000 Buffalo, Rochester and Pittsburg Railroad Co.'s 5 per cent. General Mortgage Bonds due 1937	$6,979 75	
Certificate No. 12680 of the New York Life Insurance and Trust Co. at 3 per cent	20 25	
		$7,000 00
Loubat Prize Fund :		
The accumulated income of the Loubat Fund, from which are awarded every five years prizes to the amount of $1,400, is kept as a separate fund.		
Cash deposited in the New York Life Insurance and Trust Co. at 2½ per cent		$1,033 34
McKeon Fund :		
Bequest of John McKeon of the Class of 1825, "in recognition of the kindness of the Trustees of that Institution (Columbia College) towards me in aiding me in my education." The income is applied to the purchase of law books. Established in 1891.		
Carried forward		$402,302 55

Brought forward	$402,302 55
Certificate 23, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent	$1,000 00
McKim Fellowship Fund :	
Gift of Charles F. McKim, for two travelling fellowships in the Department of Architecture. These fellowships are awarded in every odd-numbered year. Established in 1889.	
$20,000 St. Paul, Minneapolis and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds due 1933	$20,000 00
Member of Class of '85 Fund :	
The gift of Grant Squires of the Class of 1885. The income to be awarded every five years to defray the expense of a sociological investigation that promises results of scientific value. The award will next be made in June, 1900. Established in 1895.	
Certificate 24, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent	$1,050 00
Carried forward	$424,352 55

Brought forward	$424,352 55
Moffatt Scholarship Fund:	
Bequest of William B. Moffatt, M.D., of the Class of 1838, "for the purpose of one or more scholarships for the education and instruction of one or more indigent students." Established in 1863.	
$2,000 St. Paul, Minneapolis and Manitoba Railroad Co.'s 4½ per cent Consolidated Mortgage Bonds due 1933	$2,000 00
Mosenthal Fellowship Fund:	
Gift of friends of the late Joseph Mosenthal to found a fellowship in Music. Established in 1898.	
Certificate 30, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent	$7,500 00
Perkins Fellowship Fund:	
Bequest of Willard B. Perkins, who died in 1897. The income to be expended every four years for a travelling fellowship in the Architectural Department. The fellowship will be next awarded in June, 1902.	
Certificate 27, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on	
Carried forward	$433,852 55

Brought forward..............		$433,852 55
Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent...........		$5,700 00
Pulitzer Scholarship Fund :		
Gift of Joseph Pulitzer to found thirty scholarships for graduates of City Grammar Schools. One-half may be used on improvements on the new site at 116th Street. Established in 1893.		
$25,000 Niagara Falls Power Co.'s 5 per cent. First Mortgage Consolidated Bonds due 1932.....	$22,500 00	
$29,000 Manhattan Elevated Railroad Co.'s 4 per cent. Consolidated Bonds due 1990.....	27,948 75	
	$50,448 75	
Cash (used in building)........	49,551 25	
		$100,000 00
Schermerhorn Scholarship Fund :		
Bequest of John J. Schermerhorn of the Class of 1825, "for the purpose of free scholarships, the nominations to which shall vest in my nearest male relative in each generation during his lifetime." Established in 1877.		
$5,000 St. Paul, Minneapolis, and Manitoba Railroad Co.'s. 4½ per cent. Consolidated Mortgage Bonds due 1933.........		$5,000 00
Schiff Fellowship Fund :		
Gift of Jacob H. Schiff to found a fellowship in the School of Political Science, to be annu-		
Carried forward...............		$544,552 55

Brought forward	$544,552 55
ally awarded by the Faculty on the nomination of the donor or his eldest living male descendant. Established in 1898.	
Certificate 28, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent	$15,000 00
Seidl Fund:	
The proceeds of a memorial performance held at the Metropolitan Opera House on March 23, 1899, in honor of the late Anton Seidl. The income of the fund to be paid to Mrs. Seidl during her lifetime and thereafter "to be awarded at least every second year to the most promising candidate, either man or woman, prepared to devote himself to the study of musical composition at Columbia University, or elsewhere in this country or abroad."	
$12,000 Scioto Valley and New England Railroad Co.'s. 4 per cent. First Mortgage Gold Bonds due 1989	$12,000 00
Simson Fund:	
Bequest of Samson Simson of the Class of 1800 (who died in 1857). The income of the fund	
Carried forward	$571,552 55

Brought forward..............	$571,552 55
is applied to the purchase of law books.	
Certificate 25, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent...........	$1,000 00
Stuart Scholarship Fund :	
The gift of Mrs. Cornelia A. Atwill, in memory of her grandsons, Sidney Barculo Stuart of the Class of 1880, and Eugene Talman Stuart of the Class of 1881, to found two scholarships in the College, to be known as "Stuart Scholarships." Established in 1895.	
Certificate 26, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1892, at 4 per cent...........	$6,000 00
Trowbridge Fund :	
Gift of the Alumni Association of the School of Mines as a memorial to the late Professor Trowbridge, to establish the "William Petit Trowbridge Fellowship in Engineering." The income of the fund, to be not less than $500 per year, is payable to the widow of Pro-	
Carried forward................	$578,552 55

Brought forward..............	$578,552 55
fessor Trowbridge during the pleasure of the Trustees. Established in 1893.	
$10,000 Lehigh and Hudson Railroad Co.'s 6 per cent. (reduced to 5 per cent.) First Mortgage Gold Bonds due 1911	$10,000 00
Tyndall Fellowship Fund:	
Gift of the late Professor John Tyndall of London. The income of the fund to be applied to the support of "American pupils who may have shown decided talents in physics." Established in 1885.	
$11,000 West Shore Railroad Co.'s 4 per cent. First Mortgage Bonds due 2361..........	$10,945 50
Waring Municipal Fund:	
The Chamber of Commerce of the State of New York, in the latter part of the year 1898, raised by public subscription the sum of $100,000 to perpetuate the memory of the late Col. George E. Waring. The income thereof (to be not less than $4,000 per year) to be paid semi-annually to the widow and daughter of Col. Waring during their lifetime and, thereafter, the income "shall be devoted to the purpose of instruction in municipal affairs in such manner as the President and Board of Trustees of said Columbia College may direct.	
Carried forward...............	$599,498 05

Brought forward..............		$599,498 05
FOR MRS. WARING.		
$14,000 Illinois Central R. R. Co.'s 4 per cent. Bonds due 1953.	$14,000 00	
$8,000 Scioto Valley and New England R. R. Co.'s 4 per cent. First Mortgage Gold Bonds due 1989.......................	8,000 00	
Interest in Bond and Mortgage for $250,000 on "Wheelock Property," Broadway and 161st Street, Borough of Manhattan, due 1904, at 4 per cent.......	28,000 00	
	$50,000 00	
FOR MISS WARING.		
$10,000 Scioto Valley and New England R. R. Co.'s 4 per cent. First Mortgage Gold Bonds due 1989............	$10,000 00	
Interest in Bond and Mortgage of Jacob D. Butler, for $250,00 on "Wheelock Property," Broadway and 161st Street, Borough of Manhattan, due 1904, at 4 per cent.........	40,000 00	
	$50,000 00	
		$100,000 00
Clark Scholarship Fund, School of Medicine:		
Bequest of the late Alonzo Clark, M.D., formerly President of the College of Physicians and Surgeons, for the purpose of promoting the discovery of new facts in Medical Science. First prize bestowed October 1, 1894.		
17 shares United New Jersey Railroad and Canal Co.'s stock. (Par $100 each)............	$3,874 94	
Carried forward...............		$699,498 05

Brought forward	$3,874 94	$699,498 05
Bond and Mortgage on property No. 333 West 31st Street, Borough of Manhattan, due 1899, at 5 per cent	10,000 00	
Certificate 31, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent	125 06	
		$14,000 00
Harsen Prize Fund, School of Medicine :		
Founded by the late Jacob Harsen, M.D., in 1859. The income of the fund to be given in prizes as follows : Clinical Reports, three prizes. First prize, $150 ; Second prize, $75 ; Third prize, $25. Proficiency at Examinations, three prizes. First prize, $500 ; Second prize, $300 ; Third prize, $200.		
28 shares of United New Jersey Railroad and Canal Co.'s stock (Par $100 each)	$6,382 25	
Bond and Mortgage on property north side of 129th Street, 315 feet east of Fourth Avenue, Borough of Manhattan, due 1894, at 4½ per cent	15,000 00	
Certificate 32, Series 232, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage on property on Church Street near White		
Carried forward		$713,498 05

Brought forward..............	$21,382 25	$713,498 05
Street, Borough of Manhattan, due on or before March 27, 1902, at 4 per cent...........	1,624 94	
Columbia College 3 per cent. Mortgage Gold Bonds due 1909.......................	8,000 00	
	$31,007 19	
Cash on hand.................	106 91	
		$31,114 10

Abraham Jacobi Ward for Children Fund, School of Medicine:

Gift of an anonymous donor "to endow a ward for children in the Roosevelt Hospital," to be used for teaching purposes. Established in 1899.

$25,000 New Jersey Junction Railroad Co.'s 4 per cent. First Mortgage Bonds due 1986.....	$25,000 00	
Bond and Mortgage on property No. 209 East 17th Street, Borough of Manhattan, due 1900, at 4 per cent................	15,000 00	
Bond and Mortgage on property Nos. 719 and 721 Ninth Street, Borough of Manhattan, due 1885, at 5 per cent...........	7,500 00	
Certificate 279, Series 450, issued by the Lawyers' Mortgage Insurance Co., secured by Bond and Mortgage of Hudson Building (a Corporation) on property Nos. 32 and 34 Broadway and 69 and 71 New Street, Borough of Manhattan, due on or before November 1, 1905, at 4 per cent................	2,500 00	
		$50,000 00
Carried forward...............		$794,612 15

Brought forward..............		$794,612 15
Sloane Maternity Hospital Fund, School of Medicine:		
Gift of William D. Sloane and Emily Thorne Sloane, his wife, as an endowment to the Sloane Maternity Hospital to make all its beds free in perpetuity. Established in 1889.		
$125,000 Michigan Central Railroad Co.'s (Detroit and Bay City) 5 per cent. First Mortgage Bonds due 1931.........	$125,000 00	
$125,000 Chicago and Northwestern Railroad Co.'s 5 per cent. Sinking Fund Debenture Bonds due 1933..............	125,000 00	
		$250,000 00
Smith Prize Fund, School of Medicine:		
Gift of relatives, friends, and pupils of the late Dr. J. M. Smith as a memorial of his services as Professor in the College of Physicians and Surgeons from 1826 to 1866. An annual prize of $100 is awarded for the best essay on the subject of the year presented by an Alumnus of the College.		
11 shares United New Jersey Railroad and Canal Co.'s stock (Par $100 each).............		$2,337 81
Stevens Prize Fund, School of Medicine:		
Established by the late Alexander Hodgdon Stevens, M.D., formerly President of the College of Physicians and Surgeons. The income of the fund is awarded every three years for		
Carried forward...............		$1,046,949 96

Brought forward..............		$1,046,949 96
the best medical essay covering original research as determined by the committee in charge of the prize. To be next awarded in June, 1900.		
9 shares United New Jersey Railroad and Canal Co.'s stock. (Par $100 each)............		$1,899 88
Vanderbilt Clinic Endowment Fund, School of Medicine:		
Gift of Cornelius, William K., Frederick W., and George W. Vanderbilt, as a perpetual memorial to their father, the late William H. Vanderbilt, and as an endowment for the Vanderbilt Clinic. Established in 1896.		
$100,000 Michigan Central Railroad Co.'s (Detroit and Bay City) 5 per cent. First Mortgage Bonds due 1931.........	$100,000 00	
$10,000 Chicago and Northwestern Railroad Co.'s 4 per cent. Extension Bonds due 1926....	10,000 00	
$5,000 Canada Southern Railroad Co.'s 5 per cent. Second Mortgage Bonds due 1913....	5,000 00	
		$115,000 00
		$1,163,849 84

JOHN McL. NASH,
Treasurer.

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